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AMERICAN GAS ENGINEERING JOURNAL

FORMERLY

AMERICAN GAS LIGHT JOURNAL

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NEW YORK, SATURDAY, FEBRUARY 24, 1917

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CAST IRON PIPE
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CAST IRON PIPE
CENTURIES
THE FIRST CAST IRON PIPE EVER MADE IN THE WORLDS HISTORY IS STILL IN SERVICE
MORE THAN 250 YEARS OLD

St. Paul says:

"792 miles of Cast Iron Pipe here"—

thereby adding another chapter to the long story of long service given in cities throughout the world by

Cast Iron Pipe

St. Paul cannot say as to the actual length of service the pipe has given in that city because the earliest installations were not recorded. Records are not available for any year prior to 1882.

So, as far as the books of the city are concerned, St. Paul hardly gives Cast Iron Pipe its due.

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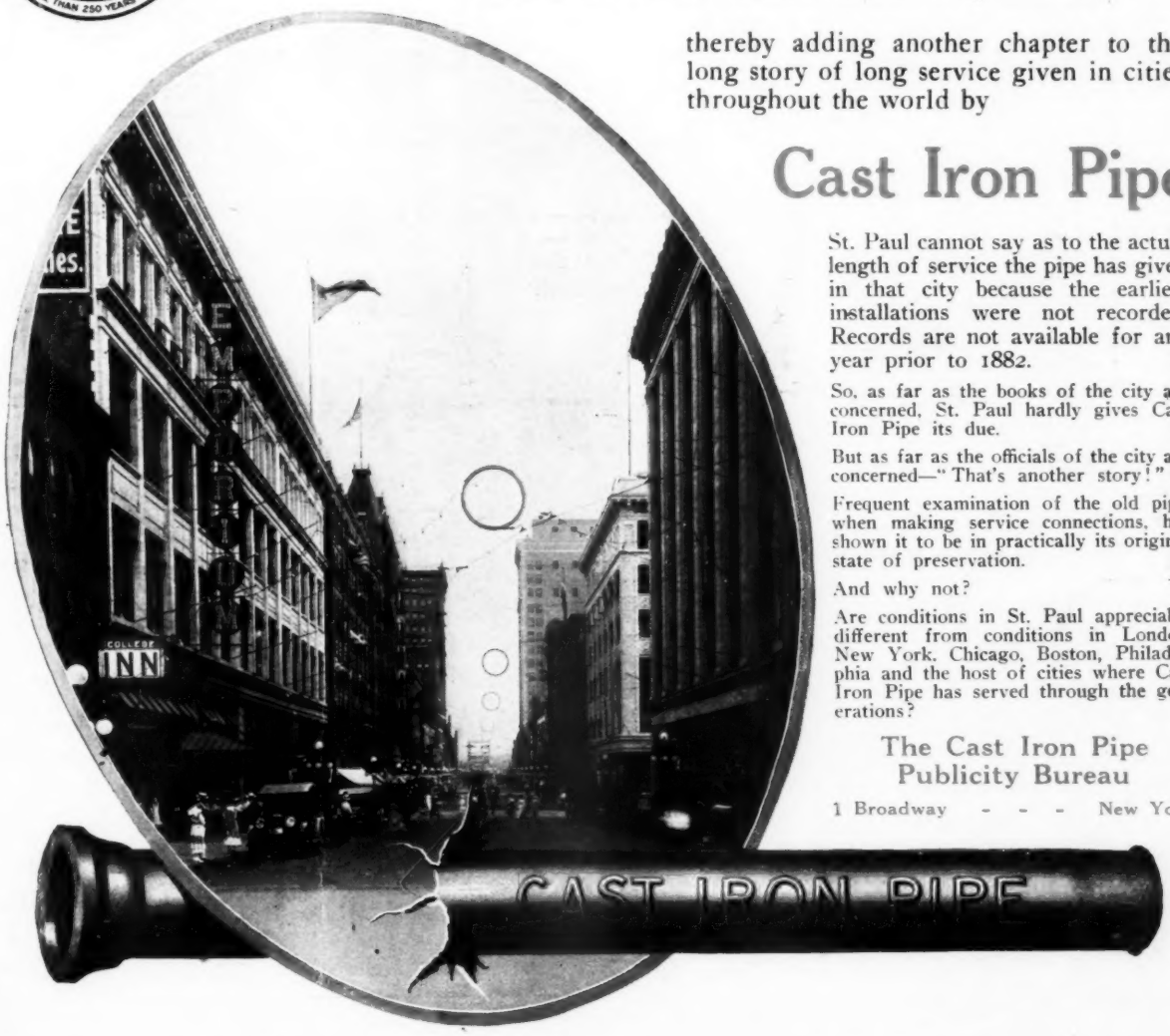

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PARSONS

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Get Acquainted With These 1917 Models

Any gas man requiring an excavator especially designed for light trenching can find the machine he wants among the four sizes of the new type Parsons Trench Excavator.

These are short wheel base machines and very light in weight compared with other makes of machines that will dig the same widths of trench. Extra large shaftings and gears give strength equal to other machines of much greater weight built to handle same range of work.

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Reverse traction and digging action for digging back under service pipes, etc.

Direct drive to digging shaft, eliminating extra friction.

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Power steering arrangement controlled by friction clutches. Makes steering easy.

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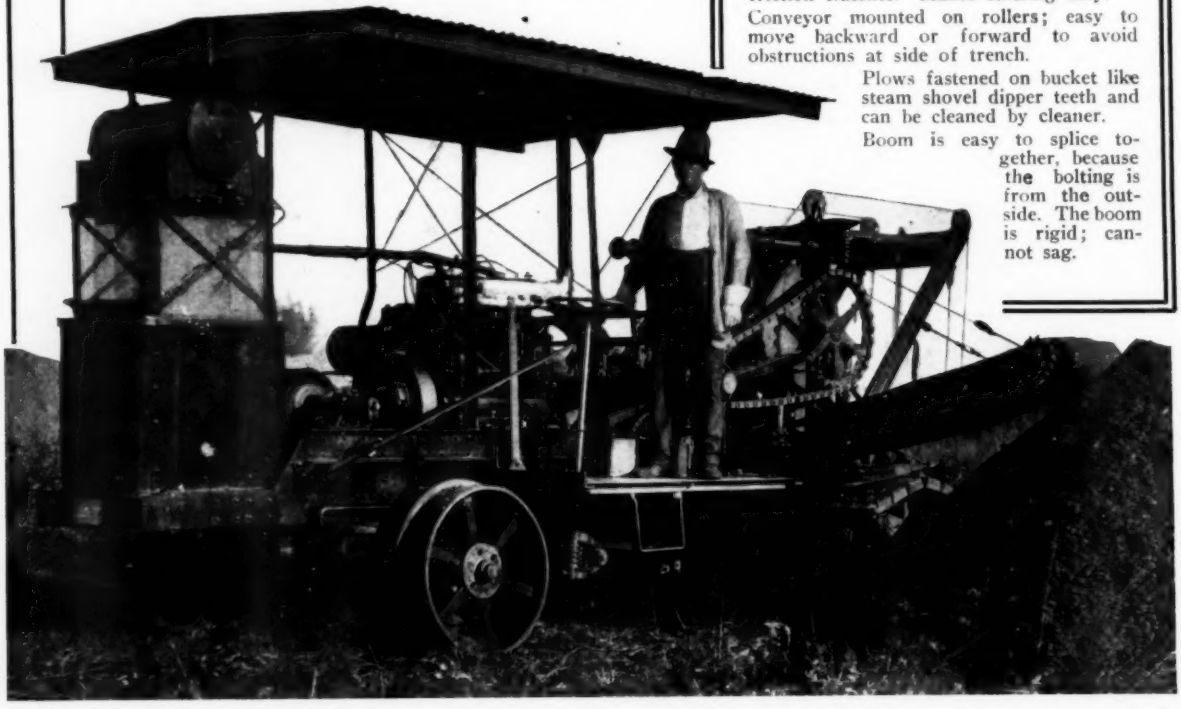
Boom is easy to splice together, because the bolting is from the outside. The boom is rigid; cannot sag.



AMERICAN GAS ENGINEERING JOURNAL

FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CVI, No. 9 NEW YORK, FEBRUARY 24, 1917 Whole No. 3077

LONG BEACH IS ONE OF THE FINEST SUMMER RESORTS ON THE EASTERN COAST.

Gas Displaces Electricity for Long Beach Boardwalk Lighting

Gas Supplied Is Pumped at High Pressure from Works Located 12 Miles Away—Supply Main Fastened to Ocean Side of Boardwalk—Lamps Subjected to High Winds Give Good Service

On the south shore of Long Island, just east of the city limits of Greater New York, and connected with Manhattan Island by excellent automobile roads as well as a branch of the Long Island Railroad, Long Beach reaches out into the Atlantic Ocean. It is a high-class summer resort and has a large population during the warm months. This, for the most part, is composed of a summer colony living in cottages, which are owned by the occupants, and guests of the hotels.

There are several hotels comparable to the best city hotels and some of them remain open the year round. Long Beach, in short, is more like Atlantic City or Newport than like the bathing and amusement resorts usually found near large cities.

Stretching along the beach is a concrete boardwalk, which is unsurpassed by the best boardwalks to be found in any section of the country. From the time this walk was constructed to within a few months ago, it was lighted by electric lamps mounted upon ornamental standards.

Campaign Aimed to Displace Electric Lighting for Every Purpose

This was hardly a place the average gas man would be likely to look for gas lighting. It is safe to say that the vast majority of both the summer residents and the business and hotel men had become much more accustomed to use electricity for lighting than to use gas for lighting.

Nevertheless, no sooner had the gas company secured its franchise than it began an active campaign to secure gas lighting. This campaign was aimed to displace electric lighting for every purpose for which lighting is used. This included not only residence, store and hotel lighting, but the street lighting and the boardwalk lighting as well.

As a result of this active work the company has already displaced the electric lamps on the boardwalk and now has in service 25 No. 50 outdoor Humphrey gas arcs. These lamps are hung on goosenecks attached to the original posts and are about 200 ft. apart. The method of construction can be seen in the accompanying illustration. Before the summer season arrives each of these goosenecks will be beautified by means of scroll-work so that they will equal, if not surpass, from an esthetic point of view, the former method of lighting.

Few Lighting Units Used with Gas

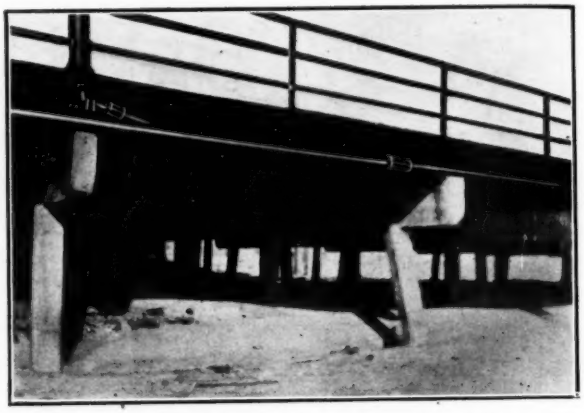
Since the gas lamps are hung about 15 ft. above the walk, are more powerful and emit the light rays to a much larger area than did the electric lamps, clear globes without skirts are used. The result is a more uniform and a softer whiter light than was the case when the electric installation was in use.

BOARDWALK DECKING A BROAD STRETCH OF CONCRETE.

The gas supply to this installation is possible only because of the practice in this section of Long Island of distributing gas at high pressure. It is apparent that the building of a gas works in a community such as Long Branch would be entirely out of the question. It, therefore, has been necessary to secure the supply from gas works that are located some twelve miles away. The gas at these works is pumped into the high pressure line by means of a steam-driven, two-stage Ingersoll-Rand air compressor and is maintained at from 28 to 30 lb. pressure.

About seven and one-half miles of the high pressure line is an old line made up of 8-in. and 6-in. wrought iron screw pipe with screw joints. The remaining line is a 4-in. wrought-iron line laid with acetylene welded joints. In the laying of this main it was necessary to cross a ship channel which is 1,200 ft. wide.

The high pressure line ends within the incorporated limits of Long Beach in a governor house. In this house there are at present installed 8 No. 4 Reynolds governors. These reduce the pressure in the high pressure lines to 3 in. of water, at which pressure it is distributed to the hotels, residences, stores, street lamps, boardwalk, etc. No holders, works, or other large structures are required. The pressure is changed in a little concrete house reaching a few feet above a sand dune.



EXPANSION JOINTS PROTECT MAIN FROM EFFECTS OF EXPANSION AND CONTRACTION.

Allowance for Expansion in Supply Main

The main along the boardwalk which supplies gas to the lamps is 4 in. in diameter. It is fastened to the ocean side of the outside floor girders with iron straps.

This leaves it in an exposed position just above the concrete piers which support the walk and just below its floor.

On account of this exposed condition and the fact that acetylene welding virtually makes a pipe line one long length of pipe, it was necessary to make a liberal use of expansion sleeves. It was made up in sections, and eight expansion sleeves are now in use in a little over a mile of main.

It was also necessary to make provision for this expansion and contraction in connecting the lamp risers to the main. This connection consists of a swing joint which takes care of the vertical expansion and contraction, and an expansion sleeve which takes care of the horizontal expansion and contraction.

Although only part of the present lamp standards are now in use, provision was made when the main was laid to connect any or all of the standards with gas. At the foot of each standard there is a tapped hole and a plug in the pipe which makes it very easy to install more lamps or change the location of any of the present lamps. The lamp risers, which are of ¾-in. pipe, are run inside of the ornamental posts which area part of the walk, and each riser is provided with a shut-off cock near the base.

In spite of the fact that the piping in this installation is entirely exposed to the weather, no trouble has been experienced with stoppage of gas due to condensation. The twelve miles over which the gas is pumped at high pressure, added to the expansion of the gas at the governor house, drys it out so thoroughly that there is very little condensation in the boardwalk line.

Installed on 5-Year Contract

These lamps are being installed on a five-year contract, which shows that it is not a trial or an experi-

mental installation. Both parties are convinced that the lighting will prove far more satisfactory than the former system. Since the installation has been made no difficulties have been experienced except those caused by the present glass situation. The very high wind pressure from the ocean gales and the intense heat of the five gas mantles necessitates the securing of a glass that not only has great strength, but also is able to withstand heat. Although at the present time it is somewhat difficult to secure such glass, this, however, has not yet proven a serious problem.

Even through these cold, windy winter months it has been possible to give good service.

The success of this installation of gas lamps in a location that from both commercial and engineering standpoints would at first sight seem extremely unfavorable is food for thought for all gas men. As has already been stated the present installation consists of 25 lamps. This number, however, will shortly be increased to 40 lamps. In addition to these lamps it is expected that at least 300 street lamps will be erected and put into service for lighting the streets of the village within a short time.

SCROLL WORK TO BE ADDED WILL MAKE STANDARD A THING OF BEAUTY AS WELL AS USEFULNESS.

As has already been made evident, this lighting has been secured in competition with electricity. It has been secured, in fact, in competition with the most modern high efficiency electric lamps that are available.

This installation was secured and is maintained by the Long Beach Gas Company, of which D. B. Helm is president and C. Walleimus is commercial manager. This journal is indebted to George MacDonald, Henry MacDonald and R. R. Rowe, of The Nassau & Suffolk Gas Company, for assistance in gathering the data from which this article was written.

Usefulness the Aim of Engineering

A hundred years ago engineering was considered a trade. Later it was considered an art, and to-day it is as much a profession as are the time-honored legal, medical and theological professions. The preparation and university training is fully as long and exacting as for the three original professions mentioned. Now that we are accomplishing the same amount of effort along constructive and useful lines, why should we not be given the same rank in the eyes of the public? We should, but like our more fortunate brothers, we must earn the recognition by long continued high-grade service and professional advertising, declared R. C. Yeoman, dean of engineering at Valparaiso University, in an address before the American Association of Engineers.

The training of the engineer has been mainly along scientific lines. This is, indeed, in the right direction. Mr. Waddell of Kansas City, in his address on "The Relation of Sciences to Engineering," analyzed the connection and developed an excellent definition for engineering. He divided sciences into two divisions: Pure and applied. Of the pure science the engineer uses mostly mathematics, physics and chemistry; of the applied, he is primarily interested in construction. The mathematician proves that the triangle is a stable figure, the engineer designs the framed structure; the physicist discovers that heat and water will produce steam under pressure, the engineer designs and builds the steam engine. Thus, the province of science is discovery. The aim of engineering is usefulness.

Of all the sciences, political science is said to be the greatest. If the engineer, a user of science, were acquainted with this, the greatest of all sciences, would he not be the ideal politician? The engineer is the purest stock from which to produce the efficient public officer. In civil life he is always building up. He tears down only as a temporary expedient to build greater and better. The lawyer is one-half the time in the wrong (defending the wrong side). Engineers should make a new start and enter this most important field and place their men where they can get the engineer's share of public esteem and compensation.

Kerr says that knowledge is not the power of the engineer, but that it is his tool, that the power of the engineer is his natural ability to do, and to act on what he perceives. Knowledge is, however, very important, even as a tool. What would you think of a carpenter who arrived on the job without his saw and square?

Returning to the training of the engineer, the sciences are considered paramount. Do not forget, in your enthusiasm over mathematics, physics and chemistry, the scientific study of the brain—that organ which you are developing as your major power element. Psychology, therefore, is a study necessary to all students and professional men in order that they may understand the machine on which their success depends. Would you consider a good mechanic a man who never saw or studied the kind, quality or limits of the tools he used on your car? Can any professional men, therefore, neglect the study of the most vital part of his success-producing machine? It is brain work that brings in big salaries and builds great reputations, not merely the rapid and accurate manipulation of a transit.

White Wash and Mortar from Calcium Carbide

A writer in *Factory* states that the acetylene residue from calcium carbide which remains after the gas has been generated makes a good whitewash. This suggests a way that it can be used to brighten up walls and ceilings around store rooms and gas works where acetylene welding and cutting have become customary. In this way the residue, artificial light and the eyes of the workers will be saved.

In Germany this same residue has been mixed with 40 per cent. of building sand to make a good mortar for stone masonry. It, therefore, is evident that there is no need of throwing this residue in the dump

Ready-Made Oxides Have Come to Stay

A. H. Scott Discusses New Forms of Oxides and Gives Results of Absorption Tests of Various Kinds

The purification of gas from sulphur compounds, particularly sulphuretted hydrogen, while constituting one of the minor items of manufacturing expense, is none the less one of the most important steps in the process, declared A. H. Scott, engineer of the Peoples Gas Light Company, of Manchester, N. H., in his paper on "Some New Forms of Oxide," presented at the annual meeting of the New England Association of Gas Engineers, held last week in Boston. The rigid requirements as to purity laid down by the regulating bodies in this country, make it imperative that this portion of the gas plant be operated at 100 per cent efficiency, as far as the removal of sulphuretted hydrogen is concerned.

In recent years, our ever-active enemy, the high cost of living, has been getting in some of his most effective work in the manufacturing departments of the gas companies, and those in charge have been urged by compelling necessity to "zamine corners" which had previously been considered more or less unimportant items of expense. One of these items is purifying material.

Liquid purification, using prepared ammonia liquor, seems to promise nearly ideal results, but has not yet been completely worked out and besides is hardly available for plants making only carburetted water gas. For this reason many works must continue to use oxide of iron and confine their efforts to increasing the efficiency and reducing the cost of this method of purification. To aid in this work there are now offered to us a large number of ready-made oxides in various forms, for which strong claims of economy are made

Advantages Claimed

The greatest advantages claimed for these oxides are, ease of handling, storing and mixing, greater uniformity in composition and in results, and greater absorption in the first few changes than the home-made iron borings oxide. The first and second claims are almost self-evidently justified. It is much easier to receive and store a few carloads of apparently inert brown dirt, mix it with shavings and water in a concrete mixer as needed, and place it in the purifier box as fast as made with no fear of overheating, than laboriously to mix and turn shavings and iron borings with constant watchfulness for trouble—not to speak of the ground space required for the older method.

The uniformity can be ascertained by analysis and test of samples before mixing with shavings and does not depend so much on care or good luck in mixing.

The claim of greater activity is not always so well grounded. Here results vary from poor to more than good, depending on the composition and characteristics of the particular oxide in question, but again we are ahead of the home-made oxide in that the efficiency can be determined with reasonable accuracy before the purchase is made.

Bog Ores Provide Greater Part of Straight Natural Oxides

It might perhaps be interesting to describe briefly the sources and methods of production of some of the better known forms of prepared oxide, without attempting any very scientific analysis of them. They divide roughly into two general classes, natural oxides and precipitated oxides, the latter usually the residue or by-product of the extraction from ore of some metal, most largely aluminum.

The well known bog ores, a form of hematite, provide the greater part of the straight natural oxides. These ores are quite widely distributed, having generally been formed by sedimentary deposits in ancient lake beds. The preparation for use as purifying material consists usually of drying, screening to remove impurities and grinding to a finely powdered form. Their value as purifying agents is variable, some of apparently similar analysis showing widely different results in absorbing sulphur. This is evidently due to differences in physical condition. These ores are being mixed with manufactured oxide by some producers with good results and many of them find a place among the useful oxides by reason of their low price, or in other words the scarcity of oxide has caused many users to tone down somewhat their demand for extreme efficiency. These oxides have the advantages of easy mixing and comparative safety from overheating.

The precipitated oxides come from a variety of sources, but the mineral bauxite is the foundation of the larger part of them. Bauxite is found principally in the south of France (it is named for a small town in that region), Germany, Ireland, and in Georgia, Alabama and Arkansas in the United States. It is the chief source of aluminum, and from it are manufactured also various aluminum salts, abrasives, and bauxite brick, the last useful because of its high resistance to the corrosive action of molten metals.

Paint Industry Another Source of Oxides

The oxide of iron for gas purifying is the residue after the extraction from bauxite of alumina. The European methods of extraction have been more efficient than those in the United States and leave but 3 per cent to 6 per cent of alumina in the residue. Here as much as 6 per cent to 11 per cent of alumina is left, reducing the value of the oxide to some extent.

The value of the American bauxites is also somewhat impaired by the presence of considerable silica. The German product, generally considered the best available, has, of course, been cut off from this country by the war. This has given a wider market to our own manufacturers, increased the value of their product and offered greater inducements to them to improve its quality.

Another source of oxide is the paint industry. Metallic paint oxides are offered which show results fairly comparable with good manufactured oxide and doubtless they will come into more general use, though at present the production is limited.

The impetus given to the dye making industry in this country has produced an oxide from aniline reduction, similar to some of the German precipitated oxide from the same industry, which promises good results, some samples showing an absorption of 62 per cent. of sulphur in four foulings. As this is comparatively new, it has not yet been thoroughly tried out on a working scale, but the later samples are far superior to those first submitted for examination and if the dye makers can retain their business after the close of the war, this should form a source of very valuable oxide.

Sedimentation from Waste Water from Coal Mines

Waste water from some Western Pennsylvania coal mines, formerly allowed to run away into the river is now producing a very efficient precipitated oxide. Called upon to abate the nuisance which this water was causing in the streams, the mine owners hit upon the scheme of collecting it in large settling basins for treatment. The sediment at the bottom of these basins was found on examination to be an oxide of iron which has shown an absorption of 60 per cent. or better of sulphur in four foulings and bids fair to take its place among the highest grade of oxides.

Finely ground pyritic cinder, containing a large percentage of ferric oxide, has met with considerable favor and in some localities has shown good results. Its structure is somewhat crystalline and some signs of fusion are evident even when it is most finely ground, but in actual service it seems to do good work.

Below are listed the results of absorption tests in a number of oxides, the foulings in each case being four:

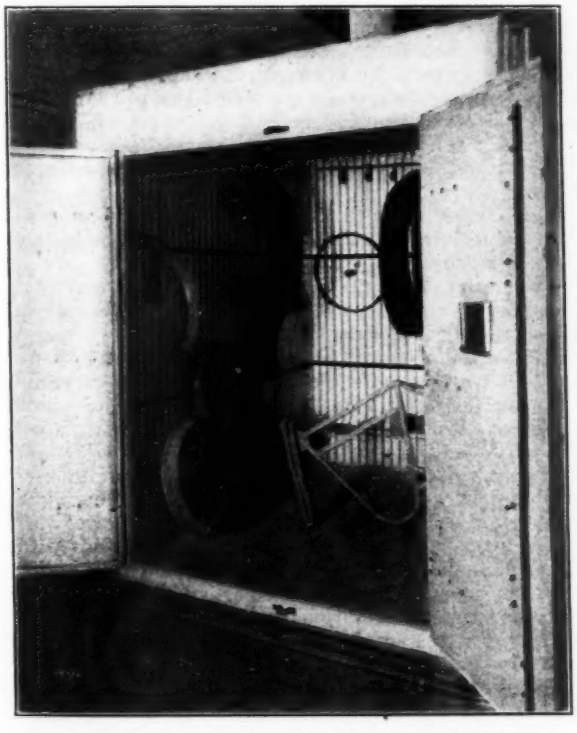
1. Pennsylvania Bog Ore.....61 per cent.
2. Hematite Ore.....49 per cent.
3. Cuban Bog Ore.....31 per cent.

4. Hydrated Iron Ore.....46 per cent.
5. Precipitate from mine water.....60 per cent.
6. Metallic Paint Oxide.....49 per cent.

7. Oxide from aniline reduction.....62 per cent.
8. Oxide from American bauxite.....35 per cent.
9. Oxide from English bauxite.....15 per cent.

10. Oxide from French bauxite.....42 per cent.
11. Pyritic cinders — treated.....53 per cent.

On the whole it may be said that these new forms of oxide have come to stay. They will undoubtedly be greatly improved and new sources will from time to time be developed. The ideal for which manufacturers and gas chemists are working is an oxide which will absorb several times its own weight in sulphur, and in a form which will not readily cause caking and the consequent channeling or back pressure in the purifiers. There are rumors that such an oxide has already been prepared in laboratory form and the day of its introduction on a commercial scale should be a red letter day on the gas engineer's calendar.

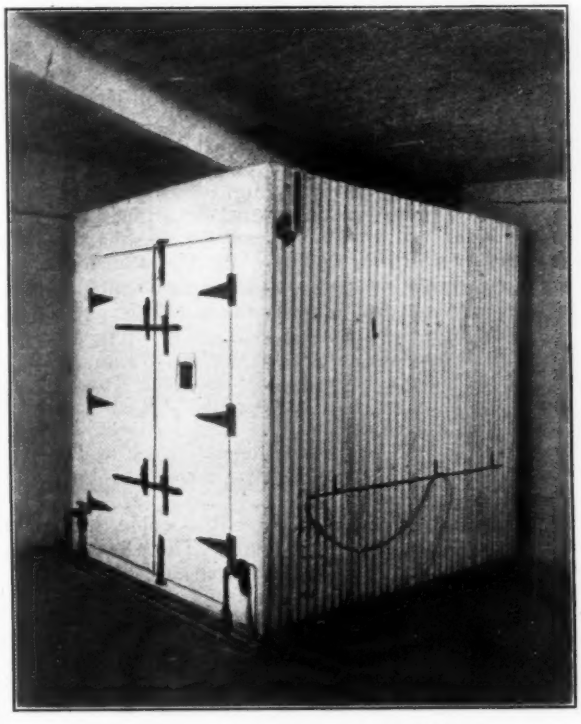


INTERIOR VIEW OF OVEN SHOWING CORRUGATED SIDES.

Gas-Fired Japanning Ovens for Automobile Finishing

J. H. MacVeigh Describes Oven Built to Meet Requirements Brought Out During Industrial Campaign

During a recent industrial gas campaign held in Bloomington, Ill., a call was made on two large concerns that were doing automobile painting, the result of which is told in the February issue of *The Bulletin* by J. H. MacVeigh, industrial gas engineer of United Gas & Electric Engineering Corporation. At that time it was explained to them the many advantages of gas fuel and how they could increase their business by installing a gas-fired japanning oven for baking the fenders and hoods of the cars they were painting. They were also shown that in order to turn out the best grade of work it was necessary to bake the finish on the fenders and hoods which are subject to the most severe use and it would be to their interest to have an installation of this kind to use as a sales argument and increase the efficiency of their service by enabling them to turn out a car in much shorter time than their competitors.



JAPANNING OVEN WITH DOORS CLOSED.

After giving the matter careful consideration, the Martens-Leary Company decided to install an oven which was designed and constructed under the supervision of the industrial department of the Union Gas & Electric Company.

This oven was constructed of two thicknesses of 24 gauge corrugated iron, with a one-inch asbestos sheet placed between them. By using the corrugated iron they secured the advantage of a dead air space caused by the corrugation of the metal and it also made a more rigidly constructed oven as it will not buckle when heated. The oven was bolted together in sections on an angle iron frame. It was then set on a hollow tile brick foundation which was cemented over and this served as a floor so it was only necessary to construct the top and sides of metal.

The thermometer used was the best that could be obtained for this work and was purchased at a cost of twenty-two dollars and fifty cents. A less expensive instrument could have been used, but it was essential to have absolute burner regulation and heat control in order to turn out the best grade of baking.

The burners were 1½-inch drilled atmospheric pipe burners with 1½-inch improved mixers. A ⅛-inch drill was used for the ports, of which there was a double row and placed one inch apart. One burner is placed on each side of the oven to extend the full length and to be about six inches from the floor. Under each burner was put a 3-inch pipe which extends the full length of the oven and is capped at one end. This pipe serves as a secondary air supply to the burners and furnishes fresh air to the oven. It is drilled with ¼-inch holes and so placed that the fresh air ports are directly under the gas ports. By this means enough fresh air is drawn into the oven to give perfect combustion and drive out the fumes from the baking japan.

In order to make this oven safe and to eliminate any danger that might be caused by the burners going out, pilot lights are placed over each burner and are kept lighted while the oven is in operation. It also makes possible lighting of the burners without opening the doors of the oven. A ¼-inch pipe with a bray burner tip makes a good pilot as the flame covers both rows of ports of the burners.

The gas consumption averages 500 cubic feet per bake, which takes about four hours. The process used on black japan is to heat the oven to 200 degrees Fahr. and hold this temperature for an hour and a half or two hours. Then the temperature is raised to 350 degrees and held for the same length of time as the lower heat. In all cases it is advisable for the japan to be tested before establishing any standard for baking as there is a great difference in enameling materials. The cost of the oven complete was $214. This included piping, burners, thermometer, baffle plates over burners, to deflect the heat and to keep inflammable material away from burners, small peep holes in doors, and double flue connections with asbestos covered flue pipe.

In addition to the above, four pipe burners were placed under a large water tank which is heated to a boiling temperature. The parts to be japanned are placed in this tank and the old enamel removed, after which they are dried and are then ready for painting.

The Martens-Leary Company is very well pleased with the installation and is securing additional business on the strength of the argument that it can now turn out a job with a finish equal to that of a new car.

This installation will bring a monthly consumption of 60,000 cubic feet of gas.

Auxiliary House Heating

A. G. Spinney Discusses Conditions in Portland, Me.—Five Rooms and Two Halls Heated at Cost of $8.20 for 35 Days

Conditions in Portland, Me., are not favorable for house heating with gas throughout the winter on account of weather conditions and price of gas, explained A. G. Spinney in his paper on "Auxiliary House Heating," presented at the annual meeting of the New England Association of Gas Engineers, held last week in Boston.

After considering the matter, it was decided to make an attempt to get as much auxiliary heating as possible, and with this in view we have made a start towards standardizing our installations, trying to make the best use of material available, and to give the same service to the consumer with one room to heat as to those who are willing to heat the whole house during the Fall and Spring.

Thermostat Control

We have made some installations in dwellings already equipped with hot water as follows:

Separating the flow and return pipes supplying rooms to be heated from the coal heater by means of gate valves, placing a small hole through the gate valve on the flow pipe, to allow for expansion. Tees placed in each pipe on the radiator side of the valves, allow the water connection of the gas heater to be made in the usual way.

For the water part of our heater, we use intermediate sections of 16-in. window radiation, bought not assembled, using enough sections to make one foot in the heater for each eight to ten feet of radiation to be heated. After the piping and heater sections are connected and tested, the heater is finished by installing the necessary burners of a standard instantaneous water heater type to consume 5 cu. ft. of gas per hour per square foot of heating surface in the heater.

The fire box is made of fire brick and the heater sections covered with a removable metal jacket asbestos lined.

Each heater has a thermostat in the hot water outlet adjusted to turn down the gas supply before the boiling point is reached.

The heater burner is lighted from a pilot and controlled by a magnet valve with push button located at some convenient place on floor heated.

We are not at all certain that we have the right combination to obtain the best results, but by carefully following the installations made, we hope to find where improvement should be made and also get information that our sales department should have on the subject.

We have now in operation five miniature house-heating trial installations which are giving excellent satisfaction. The cost, which is the feature we wish to get people generally to disregard, as they do with their automobile, is some higher than the cost of coal, kindling, ashes, etc., but without the labor, dirt, etc. In other words, if one usually uses one ton of coal per month, at a cost of $8.50 plus $0.50 for ashes, plus $0.50 for kindlings—or a net cost of $9.50, the bill for gas used to operate this heater would amount to from $14 to $20. This appliance uses 1¼ ft. of gas per minute or 74 ft. per hour or 7½ cents' worth when run-

ning in full force, but automatically shuts off (to about ½ ft. per minute or 30 ft. per hour or 3 cents' worth at $1 per M cu. ft.), when 200 deg. heat is generated, varying in time, from fifteen minutes with one radiator to an hour with four radiators.

FUEL COSTS

I have heated two halls and five rooms this year from Oct. 1 to Nov. 4, exclusively with this heater, keeping the temperature from 65 to 74 deg., according to the weather outside—and with only one large radiator in the lower hall, at a cost of $8.20—several times running it all night. Since Nov. 4, I have had my regular heater going and sometimes when I have been away, and strange to say sometimes when I've been home, the fire has gone out, then we start the auxiliary heater, and presto, my rooms are at the right temperature again, in a very short time.

We have had the following actual experience also with this heater:

Cottage house seven rooms, auxiliary heater connected to living and dining rooms, 160 ft. radiation, used September and October, gas consumption 5,600 cu. ft.

Clothing store 55 x 30 ft. floor space, with 14 ft. ceiling, 210 ft. radiation, cast-iron hot water heater, amount of gas consumed by months:

Sept. 7 to Oct. 6	1,500 cu. ft.
Oct. 6 to Nov. 6	11,200 cu. ft.
Nov. 6 to Dec. 6	16,200 cu. ft.
Dec. 6 to Jan. 4	27,300 cu. ft.

One can scarcely imagine the comfort and satisfaction derived in not having to enter the cellar, but simply press a button to turn the heat on or off, and have almost immediate response. This cost of $8.20 for 35 days represents a daily cost of $0.23. But in this case, it is less for me than coal at $8.50 per ton for I burn one ton per month, to say nothing of the kindling, ashes, dirt, and bother, and only slightly higher than coke at $7 per ton. The original cost of the apparatus is from $50 to $150, according to number of new radiators purchased or inversely the number of old ones utilized.

Room Heating

In the Spring and the Fall there is always a demand for auxiliary heat in the home and possibly in the office and the store. There is no more suitable way to supply this than with small portable gas heaters.

In installing these heaters, however, there are two precautions that should be taken. Do not use a tubing that is any longer than is absolutely necessary, and if by any chance the tubing must be very long, remove the shut off cock from the heater so that the user will have to turn off the gas at the outlet. By following this precaution the danger of gas leaks or of gas escaping from the tubing will be greatly minimized.

Perhaps, however, of equal importance is the placing of a pan of water either over or under the heater if it is to be burned for any length of time.

Increasing the temperature of air always decreases the humidity. The gas heater increases the temperature at a very rapid rate and consequently reduces the humidity to a very marked extent.

Many a complaint about a gas room heater can be settled to the satisfaction of every one concerned by the simple expedient of using this pan of water. Those heaters that are manufactured with a water pan built into the heater are already popular simply on account of the more healthy condition of the air when they are used.

It is claimed by some authorities that the greater frequency of colds in winter than in summer is due to the fact that the air in the homes is both too warm and too dry. This forms an artificial atmosphere that causes one to take cold when exposed to the normal outdoor atmosphere.

Where gas heaters are used and no moisture supplied to the air there is a possibility that the air will become abnormally dry and the user will be inclined to believe that gas heating is very unhealthy. The importance of the water pan and the training of the heater user to keep it filled with water is, therefore, apparent.

This pan makes all the difference between a perfectly satisfied customer, one who will boost gas heating, and a dissatisfied one.

Every salesman, therefore, and every gas man should do his best to see that every user of a gas heater, especially if the heater is to be used longer than a half hour at a time, should be trained to place a pan of water either beneath or on top of his heater. In selling goods it is very often the little things that count. In selling gas heaters it is surely this little thing that has a great deal to do with their successful operation.

800,000 Cu. Ft. of Gas per Day Used by Automobile Industries at Flint, Mich.

Buick Company Alone Sometimes Uses as Much as 600,000 Cu. Ft. Gas Utilized for Many Different Purposes

The automobile and allied industries constitute possibly the largest individual customers of the Consumers Power Company at Flint, Mich. The Buick Motor Company alone uses between 500,000 and 600,000 cu. ft. of gas per day—dependent upon conditions—distributed approximately as follows:

150,000 cu. ft. for testing motors on the block.

150,000 cu. ft. for enameling purposes and water heating.

25,000 cu. ft. in the die casting department.

50,000 cu. ft. in the sheet metal department.

10,000 cu. ft. for soldering purposes.

15,000 cu. ft. for blow torches and motor chipping.

50,000 cu. ft. in foundry for skin drying and preheating purposes.

75,000 cu. ft. in heat treating department.

The largest meter installation in these factories is a bank of 23 meters, 60-light capacity.

The company sells to the Chevrolet and Mason Companies 125,000 cu. ft per day; gas being used for practically the same purpose as in the case of Buick Motor Company. The Dart Motor Car Company, manufacturer of the Dart car, uses about 20,000 cu. ft. per day. The Champion Ignition Company, manufacturer of spark plugs, uses 25,000 to 27,000 cu. ft. per day.

The Flint Varnish & Color Works use in their plant for various purposes about 12,000 cu. ft. of gas per day. These people manufacture high grade paints, colors and varnish. The Marvel Carburetor Company, manufacturer of the Marvel Carburetor, use between 10,000 and 12,000 cu. ft. per day. The Stewart Body Company, manufacturer of automobile bodies, use 9,000 to 10,000 cu. ft. per day.

There is also industrial gas used in smaller manufacturing plants which are too numerous to mention.

The gas used by the Buick Motor Company varies considerably; that is, depends of course on factory operations.

This journal is indebted to W. A. Hastings, sales manager of the company, for the foregoing information.

How They Sell Gas in the South

The Jackson Light Company, of Jackson, Tenn., recently arranged a window that brought to the attention of the older generation just how fast the world is really moving. Suspended from the ceiling, and extending entirely across it, was a large sign reading: "Just an example of the changes in our heating and cooking methods which it is worth while thinking about. Come in and let's talk it over."

At one end was a sand heap, upon which was a fire of twigs and logs (a bulb in the center covered with red paper gave the semblance of flame). Over it, on a rude tripod of branches, hung an iron kettle, and in front of it were a pair of rusty flat irons. Attached to the poles was a little card on which was printed "1861." At the other side was a modern gas range, with doors open, showing bread and biscuit baking, while on top were aluminum kettle and skillet, the finishing touch being given by a pair of gas irons displayed in front. To the range was attached a card "1917." Between them was a gas steam radiator, with a little card: "Gas Steam Radiator—the latest thing. A boiler and radiator in one unit. Come in and ask us about it."

The New Orleans Gas Company, of New Orleans, La., had a series of catchy windows, each of which drove home some of the good points of gas stoves and utensils. One of the most timely of these, since the racing season is now "on" in the Crescent City, but which would attract attention no matter when or where staged, represented a miniature race track. The floor of one of the large windows was covered with a thin coat of sand, and extending entirely across it in the form of an oval was a race track about a foot wide, bounded by a green picket fence six inches high, with red gates, and little American flags at intervals. Stretched out along the course were a number of toy race horses, each placarded with a name. Finishing in the lead by a good half length was "Gas," and next to him was "Oil." Further back, neck and neck, were "Coal" and "Wood," with "Coke" well in the rear. A card just in front of the wire said: "Gas wins by a HEAT." Back of the race track were shown a gas range and also a heater for a bedroom, and above them a sign: "Gas Range (or Heater) Wins Comfort for Every Home." White cheesecloth draped the background, against which were hung willow and long stemmed poinsettas, and in either corner were potted palms.

A second window was fitted out as a laundry with gas range and boiler. Across a chair was hung some freshly laundered clothes, and, using a gas iron, a young woman in white cap and long-sleeved check apron was ironing. Suspended from the ceiling above her head was a large canvas sign: "Gas—Two Cents." Other pertinent signs set up in the window included:

WHY BOTHER WITH A COAL OR WOOD STOVE?

Gas is cheaper and more convenient—Washing day is made easy—Every household should have a range and boiler.

GREATEST ECONOMY BY USING GAS

Much money, with poor results, is spent by the old method—Invest in a Gas Range Now.

Many sections of the country, particularly in the southwest, do not require a furnace, but there are always some damp days when a fire is needed, and nothing fills the bill so well as a gas heater. A cheery picture that at once drew the attention of passers-by was produced by a combination of poinsettas and gas heaters. The floor was covered with red and white striped paper and had garlands of red paper festooned from the center of the ceiling to each corner of the room, as well as in birch-bark baskets against the wall. A number of gas heaters were shown, upon each of which was laid a poinsetta, contrasting well with the black, and a card suggested:

HAVE YOUR ROOM COZY AND COMFORTABLE

A gas heater gives you any degree of heat any time you want it.

It is well to feature not only stoves, but also gas cooking and household conveniences, as they make very desirable anniversary gifts. A cheery display of this sort was gotten up by the New Orleans firm. A rich red and black rug covered the floor and around the edges were billows of white cloth, sprinkled with diamond dust. White cloth also draped the walls, and was bordered with garlands of autumn leaves. At one corner of the room was a jardinière of poinsettas, and at the other a potted palm. At one side was a gas range, in front of which was a gas heater, and at the other side was an oak table, covered with a red velvet throw, upon which was a chafing dish, percolator and water heater. A card at one side said:

YOU ARE MISSING A WHOLE LOT IN LIFE

If you are not using all these gas appliances, start to-day

Another card, on a panel, took the form of a resolution, and was colored in artistic manner:

RESOLVED, that if life is worth living, it is worth living well.

That in future I will be thoroughly modern and up-to-date, and use gas to lessen my household duties.

(Signed) MODERN HOUSEWIFE.

Gas Being Advertised More Widely Than Ever Before in Industry's History

Never, within its history, has gas been advertised as widely as it is at present, states the February *Bulletin* of the National Commercial Gas Association, and never before has newspaper advertising formed a regular part of the plans of so many different gas companies. To mention only those whose copy has reached Association Headquarters this week, the United Gas Improvement, Old Colony, Laclede Gas Light, New York Consolidated, Boston Consolidated and the Peoples Gas Light & Coke companies are all consistent advertisers of gas, as are a number of the big manufacturers of ranges, lights, heating stoves and water heaters.

Newport, R. I., Company's New Installation Characterized by Low Labor Cost and Fine Quality of Coke

J. K. Quinn Describes Installation Made to Replace 30-Year Old Full-Depth Stack of Sixes—Operation Interfered With by Low Temperature Due to Open Side of Retort House

Early in 1915 it became very evident that if we were to continue the manufacture of coal gas at Newport, R. I., it would be necessary before another year to install some new method of coal carbonization, stated J. K. Quinn, assistant manager of the Newport Gas Light Company, of Newport, R. I., in his paper on "Inclined Slots at Newport, R. I.," presented at the annual meeting of the New England Association of Gas Engineers, held last week in Boston. Our

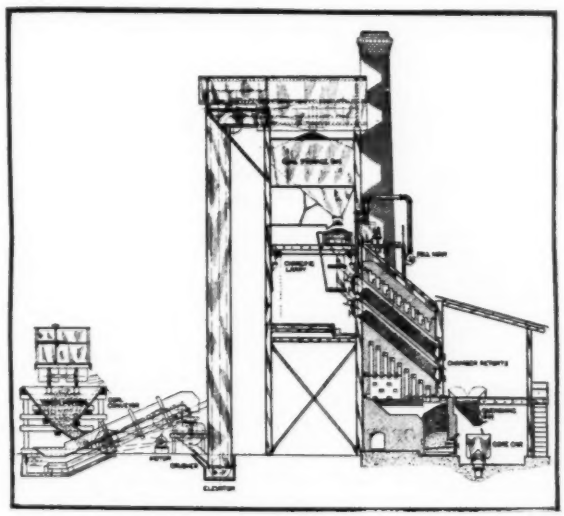


FIG. 1. ROSS SECTION SHOWING GENERAL OUTLINE OF PLANT.

old stack of full-depth sixes which had been in operation over thirty years was rapidly becoming worthless, and after visiting several up-to-date installations of various types it was decided that inclined chamber silica retorts with silica settings would operate with a minimum of labor, bench fuel and repairs, and generate a maximum amount of high quality gas per ton of coal and would be best suited to our needs and conditions. On further investigation it was found that a battery of three of the above mentioned benches would just fill an empty space at one end of our old retort house.

Late in the fall of 1915 work was started on the following new installations: Coal preparing, handling and storage plant, gas generating apparatus and coke handling plant, consisting generally of the following; one coal hopper, one pan conveyor, one coal crusher, one Peck bucket carrier and elevator, and one overhead coal bunker, one stack of three full depth benches of sixes with inclined sectional silical retorts 15 ft. long, silica settings and all iron work, circulating and flushing apparatus for hydraulic main, coke quenching and handling machinery; gas piping, etc. Fig. 1 gives a general outline of the plant with this exception, that our coal handling machinery is located in our storage shed instead of beside the benches.

Operating Details

The gas coal is received in barges and dumped into the storage shed by means of an automatic railway, and from here it is shoveled into the hopper and from there by the pan conveyor is dumped into the crusher and crushed to lumps of three-quarters of an inch or smaller. It is carried from here to the overhead coal bunkers by the Peck carrier, which has a capacity of 15 tons per hour.

All the handling of the coal with the exception of the unloading of the barge, is done by the stokers, who spend about three hours a day at this work. The crusher and pan conveyor are connected together and are driven by a 10 hp. motor; the Peck carrier is driven by a 7½ hp. motor, located on top of the coal bunkers. The bunkers have capacity of over 50 tons of coal. The coal handling machinery is driven by three phase A. C. motors at present, but very soon we expect to have our own D. C. installation in operation. This is necessary on account of the rather high rate which is charged for electric power.

FIG. 2. RETORT HOUSE AT NEWPORT, R. I.

The coal drops from the overhead bunkers into a traveling larry through three discharge valves, and from this falls into the retorts by gravity.

Only one larry is used because there is not enough room on both sides of the benches to operate two.

The coal is held back from the lower doors by means of shields which are hinged and which are hoisted clear of the charge as it runs out by chains hung from the roof.

The coke drops into water-sealed quenching bins and as soon as the charge is all out, the covers are thrown down and the coke is cooled by steam and water at the same time.

From here the coke falls into a coke car and is brought either to the upper floor for use in the furnaces or for the water gas, or is run out to the coke crusher or dumped in the yard.

The flushing and circulating apparatus for the hydraulic main consists of a steel separating tank which receives the tar and liquor from the hydraulic main and a liquor circulating pump which forces the hot weak liquor from this separating tank through the hydraulic main so that pitch, carbon and heavy tars are forced out at the tar and liquor overflow. The tars from the separating tank are run into the tar well. The coke we make is large in size, of a hard, firm structure, gray in color, closely resembles metallurgical coke and withstands a great deal of handling.

The Chamber Retorts

The unit itself consists of one battery of three benches of six 40-deg. inclined chamber retorts. The retorts are 15 ft. 8 in. long, 16 in. wide at the bottom end and 12 in. wide at the top end, and 28 in. high; the retorts themselves, the settings and the saddle walls all being made of silica. The retorts are designed to carbonize 1,500 lbs. of crushed Westmoreland gas coal in 12 hours.

They are equipped with self-starting mouthpieces which are rectangular in shape and have a one-inch asbestos rope fitted into a groove in the door, which when it is compressed against the face of the mouthpiece makes a perfectly tight joint. They also have a hand wheel, the screw of which works through the cross bar against the door, making a tight fit and also eliminating the troublesome eccentric.

The off-take pipes are located on the charging side of the retorts. The battery is located at the end of our old retort house and takes up a ground space measuring 34 ft. 6 in. long and 12 ft. 9 in. from front to back.

Each bench is equipped with a full depth recuperator to preheat the secondary air which is admitted through four adjustable air slides, two for the front half and two for the rear half of the setting.

Each bench has also a steam-jet primary air blower with steam superheated to supply primary air and steam to the fuel bed.

The generators are outside and are so arranged that they may be charged with either hot or cold coke. The benches are heated by nine parallel flues, each one having a separate air and draft control.

The foundations were installed by the gas company according to specifications furnished by the contractors. The coal and coke handling machinery, the benches and all the rest of the apparatus necessary to make the change was furnished and installed by the Gas Machinery Company, of Cleveland, Ohio.

Operation of Benches

Six retorts are discharged and charged every four hours and at the present time we are charging an average of 1,500 lb. to the retort. The generators are charged with cold coke every two hours, cleaned twice a week and dropped whenever it becomes necessary to remove any clinker. We have no regular scurfing time as it is only necessary to remove the carbon at long intervals. The stand pipes are reamed before every draw and are burned out once a week to prevent any great accumulation in them. The dip pipes are sealed five-tenths of an inch and the hydraulic main is kept under a slight vacuum to insure an almost neutral condition in the retorts. We have had no trouble with the hydraulic main after the first two weeks, it being free from pitch and heavy tars at all times.

Operating Labor

The labor required to operate the benches consists of eight men, four on the day shift and four on the night shift. This includes the night foreman.

These men do all the necessary work around the benches, such as drawing, charging, cleaning the furnaces, taking out the ashes, charging the furnaces, handling the coke, feeding the coal crusher, and keeping the place around the benches clean; in fact, they do everything except crush the coke.

It would be possible to run the benches with less labor if we did not include the feeding of the coal crusher among their labors, but as there would be nothing gained in the end, except that a few figures would be changed, and this arrangement gives the men a chance to rest when they shift to night work, we decided to run the shifts after this fashion. The average time for discharging and charging six retorts is about 35 minutes.

From the short time we have been operating the chamber retorts the results have been very satisfactory, and to our mind they possess the following advantages: The operation of them is very easy, the heat control is simple, they have the advantage of discharging and charging by gravity, the labor cost is low and a very fine quality of coke is obtained.

When the paper was first promised last February, the work was to have been finished by April 1, and we hoped at that time to be able to give some very interesting figures on the operation of these benches, but the delay by the railroads in handling the material at that time postponed the starting of the benches until late in July.

The siding for the retort house has not arrived yet, and as the temperature is very low at times, and is generally accompanied by very high winds, our operating results during these periods suffer accordingly. Sometimes during this season of the year our hydraulic main and foul main are covered with snow and ice and remain that way for several days, so you see that we could hardly get good results under such conditions. However, during the months of August and September we carbonized 1,454 tons of coal with an average yield for the two months of 5.45 per lb. We have been averaging about 13 lb of coke per 100 lb. of coal carbonized, but hope to bring this down a little after we are all straightened out.

These two months are given as examples because the results were not affected by weather conditions. All things considered we believe that this first installation of 40-degree inclined chamber retorts has justified all the claims that were made for it.

More Real Information on Gas Coals Obtained During Last Year Than Ever Before

Francis E. Drake Gives Results Obtained at Lynn, Mass., from Several Different Coals in Course of Regular Routine Work Under Normal Operating Conditions

The past twelve months have presented unusual conditions to our industry, for not in many years have the costs of raw materials reached such heights as during the year nineteen hundred and sixteen, declared Francis E. Drake, manager of the gas department of the Lynn Gas & Electric Company, of Lynn, Mass., in his paper on "A Few Gas Coals We Have Used," presented at the annual meeting of the New England Association of Gas Engineers, held last week in Boston. This increase in cost of materials, coupled with the scarcity and high price of labor, has imposed a heavy burden which has been difficult in many instances to overcome and in all cases has tried the mettle of those engaged in the gas industry.

Fortunate has been the company with a long term contract for a standard coal at the old prices, and for their full requirement, and still more fortunate are those who, having contracts, have been able to obtain their full quota in spite of embargoes and lack of bottoms. Because of these conditions, probably more experimenting has been done with coals during the past twelve months than during any like period in the history of our industry. Anything that looked like coal and was quoted at a reasonable figure has been taken on and given a try-out, with the result that more real information and data on different coals has been obtained than ever before.

In the accompanying tables are carbonizing results obtained at Lynn with several different coals. Of these, there are standard gas coals which have been used for several years, while the other two are snap cargoes picked up to fill the gaps. The results as given were not obtained under test conditions, but were gathered as part of our regular routine under normal operating conditions and with no idea of publishing at the time.

Equipment

The results were obtained on inclined retorts 18 ft. long, 16 by 25 in., cross section, with nine retorts to a bench. There are ten benches in the house divided into two stacks of five each, and of the ten benches eight have been renewed within the past three years and above the combustion chamber are constructed of silica.

In explanation of the tables, it would be well to note that the coal is measured, not actually weighed into the retorts, but over a period of ten years, checking up every two years, we have found an average shortage of but 2 per cent., so from the coal figures 2 per cent. can be deducted and you may be reasonably sure of the results. In Table II (Coke Results), pounds coal charged and pounds coke drawn, both the coal and coke were actually weighed upon scales sealed by the sealer of weights and measures. The station meter was tested during the past summer and found to be correct, so the gas results are probably accurate as they are corrected for both temperature and barometer. The B.t.u.'s of the gas were obtained on a Hinman Junkers calorimeter, both at works and office, while the coal B.t.u.'s were obtained on an Emerson Bomb calorimeter. The analyses are all on a dry basis and were made in our laboratory. The temperatures were obtained with a Fery radiation pyrometer, which we have since returned to the makers for calibration and found to be 100 deg. low.

Results

Kind	Period of Test	Lbs. Carbonized as Charged	Gas Made Corrected 60°	Ft. per lb. as Chgd.	B.T.U.	Thermal Feet	Retort Yield	No. Bench Operating	Make per Bench	Av. Lbs. Coal Charged per Retort	TEMPERATURES Retorts Before Charge	TEMPERATURES Retorts After Charge	TEMPERATURES Ash Fusing Temperatures
1	March 7, 1916 to March 13, 1916 Incl.	1,839,060	9,267,713	5.04	626	3155	18,460	8	165,494	915	1910° F.		2600° to 2650° F.
2	July 15, 1916 to July 20, 1916 Incl.	1,538,800	7,975,617	5.18	603	3124	18,821	8	166,159	898	2070° F.	2030° F.	No Sample Obtainable.
3	Oct. 16, 1916 to Oct. 18, 1916 Incl.	1,011,440	5,220,882	5.16	573	2957	19,776	10	174,000	958	2070° F.	2100° F. 2160° F.	2250° to 2300° F
4	Nov. 14, 1916 to Nov. 19, 1916 Incl.	1,713,990	8,840,220	5.19	581	3015	20,666	8	184,171	1000	2170° F. 2200° F.	2150° F.	2570° F.
5	Nov. 29, 1916 to Dec. 1, 1916 Incl.	870,050	4,696,278	5.39	619	3336	21,970	8	195,678	1009	2130° F.	2150° F.	2550° to 2600° Fn

FIG. 1. SHOWING FUSING TEMPERATURES AND TEST RESULTS.

Fusing Temperatures

The thought did not occur to us to obtain the fusing temperatures of the ash of the various coals until after we had been requested to present these results at this meeting and as we had destroyed our samples and the various cargoes were either used up or mixed in our

(*Continued on page 206*)

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Displacing Electric Lighting with Gas for Every Purpose for which Lighting is Used

The spirit of being satisfied with merely holding our own in the lighting field is in nowise representative of the gas industry. If our lighting business is worth retaining at all it is worth increasing. The spirit manifested in the policy of the company concerned in the installation described in the leading article in this week's issue in actively campaigning "to displace electric lighting for every purpose for which lighting is used" is the kind of spirit this journal delights in seeing manifested, as it truly believes such is the spirit of the gas industry to-day.

One inclined to be skeptical might consider this a rather ambitious program; might think that the company takes itself a little too seriously. Whatever the consensus of opinion in this regard, the facts—as narrated in the article—speak for themselves.

Though its works are located 12 miles away the company has, in the words of one of its officers, "done quite well" in its lighting business at Long Beach.

This was a case where electricity was already established. Gas came in and took its place.

Three Dollars Worth for Three Dollars

An esteemed contemporary—we are sincere in our use of the adjective, for we believe it is rendering the gas industry a truly valuable service—takes us to task in our assertion that something is lacking in the gas journals.

That something, according to our viewpoint, is an adequate representation of the real talent that exists in the field they cover. Our criticism is that too little work is being done to stimulate and encourage contributions from those who are doing the real work of the gas industry, and who are therefore best qualified to point out its significance.

Our contemporary, however, apparently takes the stand that the industry is getting all that it pays for. If it paid more, it would get more: Three dollars worth for three dollars, two dollars worth for two dollars, and so on, all the way down to twenty-five cents.

This standard is somewhat puzzling to us. We are quite sure that there are very few numbers of our contemporary published—and we have read his production carefully—that do not contain within themselves more than three dollars—his annual subscription price—in value to each and every subscriber engaged in the gas business.

Perhaps the mere cost of editing, paper, type-setting, printing, etc., represented in the average copy printed, does not exceed three dollars per year, though we greatly doubt it, but we are quite certain that the intrinsic value of the information disseminated cannot by any means be measured by this standard.

THE AMERICAN GAS ENGINEERING JOURNAL has never measured itself by this standard. We doubt very

much if we gave much time to counting out with each issue whether or not we were exceeding in value that proportion of the three dollars our subscriber is paying us for his annual subscription, if we would have time enough left to get out the paper at all.

We published some weeks ago, for instance, an article in which the author described in detail an industrial installation that is available to most any gas company. It is quite likely that many, enlightened in this regard, will as a consequence put considerable of that class of business on their lines.

How much this service was worth in dollars and cents would be difficult to calculate. If we had paid the author in proportion for the article we would most likely have gone bankrupt. If we charged our subscribers for it in proportion to the benefit derived we wouldn't have many subscribers.

Conserving Employees

Along with the conservation movement has come better care of machinery, better and more carefully cared for domestic animals, and, last, the welfare of employees. It is apparent to any employer that it pays to take good care of all machinery. It is apparent that it is cheaper to keep the machinery clean and well oiled than it is to try to save on labor and material by leaving it dirty and without oil. Employers also pretty well agree that in the long run it is cheaper to buy good horses and take good care of them than to buy cheaper ones and simply work them to death. That which is not always so apparent, however, is that the principles applying to machinery and horses also apply to the employees.

There are many large employers of labor, however, who have discovered to their profit that it does pay to take good care of their employees, and to make it their business to see that they are well fed and housed and that other features contributory to contentment are provided for.

Some concerns go to great lengths in their employee-welfare work. Some build houses which they sell at very easy terms to those of their employees who desire to buy them. Others build whole villages. The houses in these villages will vary as much in style as those in an ordinary village, but will all be well built and either rented or sold to the employees.

In the plants also will be found perhaps a gymnasium, swimming pool, shower baths, etc., designed to help the employee keep himself healthy. That portion of the welfare work which is becoming most common, and which those concerns which have tried it seem to have found the most profitable, is the company dining room, where the employee is given his midday meal either absolutely free of charge or at actual cost.

These company dining rooms are now becoming very common among gas companies. Nearly all of the large gas companies are now providing for them in their new buildings. It has been found that the increased efficiency of the employees during the afternoon more than offsets the cost of operating these dining rooms.

As has already been stated, some concerns value these dining rooms so highly that in order to persuade as many employees as possible to eat in them they give the meals entirely free of charge. They find that when an employee eats a cold lunch or buys a meal at a lunch room, drug store or restaurant he is likely to fail to get the desired amount of nourishment and that his afternoon work suffers as a consequence to an extent that exceeds the cost to the company of providing him with a good meal.

Gas companies who are building new buildings or who have adequate buildings, but are not satisfied with the results they are securing from their employees, would do well to look into this welfare work. This form of profit sharing appears to be by far the most successful form that has ever been undertaken.

Publicity

There is a certain proprietary remedy that had a sale of 3,000 bottles a year, forty-four years ago, but which now has a sale of over 10,000,000 bottles, or approximately $6,000,000 worth a year.

The remarkable feature about the growth of this business lies in the fact that the sales have steadily increased year after year, and this in the face of one period when the sales of nearly every other prepared and advertised remedy either fell off or practically ceased altogether.

One reason for this success lies in the constant conservative honest publicity that has been given to it. No one has been urged to buy it, but everyone has been shown in an honest, sincere way just what it will accomplish. As a result of this policy not only practically every dealer in this and other countries carries it in stock, but physicians even prescribe it for their patients.

The remedy possesses a real remedial value and it has been given constant though conservative publicity; that is, the advertisements have made no extravagant claims. Every user has likely found it better than the advertising has led him to believe it might be.

This remedy has been on the market for about the same length of time as the gas range has been. At the present time no other remedy could possibly displace this old one that has been in the good graces of the public for so long.

It has been proved time after time that it is only through publicity, through advertising, that goodwill can be built up. During its past history the gas business has never been obliged to face competition that is at all keen. Now, however, is promise of keen competition.

Gas men should give this subject of publicity very careful consideration. All industries that are liberally advertised are rapidly growing.

Coke Results—Analyses (Dry Basis)

Kind	Period of Test	Lbs. Coal Chd.	Lbs. Coke Drawn	% Coke to Coal Chd.	Coke Drawn Bu.	Lbs. Breeze Screened ¾ Mesh	% Breeze to Coke	COAL						COKE				
								M.	V.M.	F.C.	Ash	S.	B. T. U.	M.	V. M.	F.C.	Ash	S.	B.T. U.
1	March 1, 1916 to Mch. 13, 1916 Incl	1000	747	74.7	20	38	5	.48	37.01	55.985	7.005	1.2357	13,897	2.00	3.90	86.05	10.05	4.135	12,532
2	July 15, 1916 to July 20, 1916 Incl.	1000	726	72.6		34½	4.7	.42	36.23	56.76	7.01	1.30	13,164	.62	2.33	87.67	10.00	1.37	12,320
3	Oct. 16, 1916 to Oct. 18, 1916 Incl.	1000	707	70.7	21	30	4.25	1.22	37.78	55.22	7.00	1.65	13,969	11.50	5.00	82.96	12.04	1.676	12,819
4	Nov. 14, 1916 to Nov. 19, 1916 Incl.	1000	729	72.9	21.5	65	9	.80	35.45	55.70	8.85	1.098	13,617	2.50	1.45	87.04	11.51	2.02	12,390
5	Nov. 29, 1916 to Dec. 1, 1916 Incl.	1000	774	77.4	22	65	8.4	1.02	35.29	61.99	2 72	.63	14,708	.78	.81	93.98	5.21	.42	12,991

FIG. 2. COKE RESULTS—ANALYSES ON A DRY BASIS WERE MADE AT LYNN GAS & ELECTRIC LABORATORIES.

(*Continued from page* 203)

piles, we consequently are unable to give the fusing point on the cargoes as received. However, the "Fuel Testing Company" have made many tests on coals 1, 3, and 5. To them we sent a sample of a later barge of coal 4 and in Table I will be found the fusing temperatures as submitted by them.

No records of tar and ammonia were kept because the tests covered such a short period of time and the facilities for accurate determinations were poor.

Sulphur

Records of the total sulphur content of the gas as manufactured from these various coals unfortunately also were not kept, but as a matter of fact, using coal 4 as a base, it is possible to operate ordinarily, at our plant, about two weeks without changing a box, while with coal 3 that period runs only from five to seven days, passing substantially the same amount of gas. On the other hand, running coal 5 and passing the same amount of gas, the period of purifier changes, as compared with coal 4, is usually lengthened to three and sometimes four weeks. Coals 1 and 2 were not run long enough alone to compare results in a practical way.

The structure of the coke derived from the above coals and its action in the generators (both coal and water gas) was about as given in the paragraphs below. Much better results can be obtained, however, by properly blending certain of these cokes than by running any one of them separately .

Coke

Coke 1: Hard, of close texture. Clinkers close to grate bars. Good results in water gas. As compared to coke 4, which has always been our standard, the make increased 7 per cent.

Coke 2: Hard, of good texture. Clinkers very hard and flinty, well up on sides of generator, requiring frequent barring down. Good results in water gas. As compared to coke 4, the make increased 10 per cent.

Coke 3: Very hard, flinty coke, of close texture, and forms a tough glazed clinker close to the grate bars. Poor results in water gas. As compared to coke 4, the make decreased 3 per cent.

Coke 4: Medium hard, of good texture. Forms a medium hard clinker high on sides of generator, requiring frequent barrings down. Fair results in water gas.

Coke 5: Soft, friable coke, of good texture. Makes no clinker in the generators and leaves but little of a fine ash. Fair results in water gas but not sufficient body to coke. As compared to coke 4, the make increased 2 per cent.

Price

In closing this article, one point is of particular interest and that is "price." Using coal 3 as a base, coal 1 costs the same; coal 2 costs 35 per cent. more; coal 4 costs 11.8 per cent. more and coal 5 costs 10 per cent. more. It is well to note that the comparisons are based on normal, not war prices, also that in these figures no attention has been paid to the gas or residual value of the coals.

Preventing Accidents By Forethought

A fitter, while carrying a length of pipe, turned quickly and the swinging end struck a fellow-employee in the face.

While carrying pipe or other long objects be mindful of the safety of those near you and be cautious when approaching and turning corners. This also refers to carrying pickaxes.—*Safety News.*

Good Street Lighting Service an Advertisement for Gas for Lighting

J. C. D. Clark Discusses Trend of Opinion Towards Lighting for Illumination in Streets and Declares in Effect that Once This Idea is Adopted Gas Has Advantages that Will Enable It to Win the Business

The item of expense most keenly felt in the lighting of a city is that of installation. It calls for a large investment in a short space of time and is, therefore, more conspicuous than the maintenance cost which is distributed over a longer period. Owing to the large fixed investment it is of great importance that the system installed be one that will meet the needs of the city for a long time, will not become obsolete and can be maintained at a reasonable cost.

"All street lighting belongs to one of two general classes," declared J. C. D. Clark in his paper on "Gas for lighting," presented at the annual meeting of the New England Association of Gas Engineers, held last week in Boston, "and the first step in choosing a system is the selection of one of two methods."

Beacon Method Drifting Into Disfavor

Method 1 is beacon, or spectacular lighting. It consists of high-power lighting units placed at considerable distances apart and usually high above the street or sidewalk level.

Method 2 is lighting for illumination. It consists of units of moderate intensity so spaced that the light from one unit coalesces with the light of another, producing an even and continuous lighting effect throughout the field of the installation.

I have obtained from lighting experts in 26 American cities reports on the system of lighting now in use on their streets. These reports as a whole prove that lighting for illumination is coming strongly into favor and replacing rapidly the beacon and spectacular method.

I quote from a few of the reports:

"The most common objection to the beacon method of street lighting is the uneven and wasteful distribution of the light. I believe that the tendency in the past has been somewhat toward high candlepower units hung high above the street, but I believe this practice is fast going out.

"I feel that the large candlepower units, in the suburbs especially and through the residential districts, furnish a very poor method of illumination; the smaller units at more frequent intervals, whether with gas or electricity, are much to be preferred on account of the more uniform distribution of the light."

Sidewalks Should Be Favored in Lighting Rather than Roadways

"With the higher lights the illumination is not nearly so even; it is more or less glaring and in consequence makes it harder to see a long distance.

"All sorts of ornamental lighting ideas are being exploited, but it seems to be the opinion of those who are studying the subject that the greatest efficiency should be aimed at in the type of unit employed so as to give more actual illumination of the street without materially increasing the expense.

"I have always personally preferred low lamps and this was our strong argument in the old days for gas lamps, for the reason that with so many shade trees on the boulevards in the residential parts of the city, the high lights were obscured and the sidewalks made very dark, the lighting being almost without effect."

J. R. Cravath, electrical engineer, in a discussion before the Illuminating Engineering Society, said: "Within the past few years considerable intelligent effort has been directed toward producing more uniform illumination along a street on the theory that the extreme contrast between the areas of high and low illumination is detrimental to seeing clearly, as is also the blinding effect of high candlepower lamps spaced at frequent intervals."

The State University of Iowa, in a bulletin of street lighting, gives these conclusions: "Any system giving an illumination of less than this (.02 lumens per square foot) at any period along the highway will be considered a beacon system, even though the intensity may be higher nearer the light source.

"Since most of the traffic is on the sidewalks and the swiftly-moving vehicles carry lamps of their own, the needs of the foot passengers should be given more weight in the planning of the light system than those of the drivers of horses and automobiles.

"The light sources, therefore, should be placed so as to give the greatest intensity of illumination on the sidewalks, particularly at the crossings. Where additional lamps are used, they should be placed near the edge of the sidewalk on the curb line.

"When the street is really to be illuminated and not merely supplied with beacons, small lamps placed close together are more economical. The utilization of light from powerful sources is very poor on account of the large proportion of the light that is wasted."

Sordid Objections to Placing Lights at Low Elevation

There are but two reasons for the placing of high intensity lamps at high elevations. One is technical and the other commercial.

The technical reason is that such lamps within the line of vision would throw a blinding glare into the eyes of passers-by.

The commercial reason is that light at the sidewalk level interferes with the sale of light for the interiors of shop windows.

By so placing the lamps that the major part of the illumination is thrown into the sky and the sidewalk left in the shadows, the light salesman makes a market for double the quantity of light that would be required if the rays were effectively used.

C. F. Lacombe, chief engineer of illumination in Greater New York, says in an address on the illumination in that city: "In street lighting, unless surrounding buildings are to be especially illuminated, the useful rays are those that can be directed toward the ground. To make this agreeable, the point source of an arc lamp, for instance, must be made into a ball of softened light by diffusing globes or shades, and this, so far as possible, thrown toward the ground by either interior or exterior reflectors.

"When gas light or electric light, modified to the intrinsic brilliancy of gas light by diffusing glassware, is used, the only technical reason for elevated lamps vanishes and the sordid commercial reason is all that remains."

From these reports and my own observations, I believe street lighting with gas using Method 2 is the system that should be pushed by all companies. St. Louis, Chicago, and Milwaukee are increasing their sales through street lamps. New equipment has been used in some cases. Chicago's gas inspector has in use a lamp head that is used for gas or electricity. When gas is used they obtain 30 per cent. more light for the same money.

Advertising Value of Street Lighting

E. C. Jones says: "In 1907 we had 3,607 gas lamps in San Francisco. This number has gradually increased to 8,331 at the present time. The continual healthy growth of gas lighting in our city has established itself in spite of low-priced electric current and is popular. There is no doubt that the public sense agrees that the best street lighting is by moderated candlepower units at short intervals and low elevation."

In 1872 this association asked its members to report the number of public lamps in use. This, as you will note, was forty years ago.

Now what have we been doing in the meantime? Have we kept ahead of the times with our service? Have we encouraged city officials to try improved equipment? Have we kept the demand for gas street lighting before the people?

Why should the use of our product and equipment be discontinued and a lighting unit be installed in its place that is no better than ours, if as good?

Why should city officials encourage this expense?

Why should the people pay interest on dual equipments, one of which is idle?

As stated before, Method 2 is lighting for illumination, and our product, when used in modern equipment, meets these requirements fully and can be sold at a price that will win, conditions being fair and equal.

Good street lighting service is a standing advertisement for "Gas for Lighting."

Commercial Lighting Field

This is the field your competitor usually starts in. Theatres, office buildings and stores are quickly changed over. We are busy placing fuel appliances, and little attention is paid to an old customer. There comes a time when we feel the inroads that have been made in our business, and approach our old customers in an attempt to win them back, and find them in a different mood than when we were serving them.

They tell us they are glad to get away from a system that in the past has kept them busy buying lights and supplies, and, having discarded their piping and fixtures, they do not feel inclined to re-invest again. Right here we learn that it is better and less expensive to keep old customers than it is to add new ones or to regain old ones.

Both the companies and the customers should profit by their past experience when the customer controlled the lamp and maintenance was optional.

To create a demand for commercial lighting, hold our present customers, and attract new ones, I believe the best plan is for the companies to rent arc lamps to their customers at the lowest rate possible and maintain at their highest efficiency at all times.

The Peoples' Gas Company of Chicago in June, 1907, after five and three-quarter years' experience in renting arc lamps concluded that the promotion of arc lighting at the rate of $9 per year had been a useful and profitable undertaking. This same year a reduction of this rate was made to $5.40 per year. Jan. 1, 1917, this rate was reduced to $3.15 per year, and 5,000 new installations were made the first month the reduction went into effect. The second month's installations will no doubt be greater.

The renting of arc lamps should result in several important advantages to the companies and customers.

First.—Increased sales of gas.
Second.—Possession of the field.
Third.—Control of appliances.
Fourth.—Demand for more light.
Fifth.—Standard of store lighting.

Increased Sales of Gas

The arc light business should be credited with increased consumption over and above original consumption without arcs.

Installations replacing other methods of lighting and all outdoor installations, produce 100 per cent. increased consumption.

We should include in this 100 per cent. class all cases where competition has been resisted by use of the arc.

Salesmen would be able to take orders in a great many cases where they have heretofore failed on account of customers objecting to buying arcs, and should be able to displace many smaller units now in use.

Possession of the Field

Rental arcs installed for our present customers (where practicable) would give us possession of the field as far as store and factory lighting is concerned. Other methods of lighting will be preferred in some cases, regardless of cost, but, in a great number of cases with gas at present prices and a low rental rate, we can successfully resist competition.

The advantages of being in possession of the field are obvious: Through our lamp trimmers and inspectors we would be in close touch with our customers, and would be able to anticipate their requirements or complaints.

If a customer became restless under what he thought was a large expense for lighting, we would be right on the ground to modify his equipment if necessary, or, to satisfy him that he is getting more light for his money than by any other system; and, when he is approached by salesmen of other methods of lighting, we would know of it, and would be ready to refute their claims.

Our competitors keep up an active campaign for business, and are making very attractive offers to our customers. If we are to combat this influence, possession of the field will be very much in our favor. In other words,—it is far easier to protect our business than to regain it.

Control of Appliances

The business of installing and maintaining arc lights gives us absolute control over the selection and care of the appliance through which our gas is used.

The importance of this cannot be overestimated.

The market is flooded with worthless lighting appliances. Our consumers are continually harassed by salesmen offering burners and mantles warranted better than anything they have had before, and are prevailed

on frequently to change their lighting equipment, thus incurring useless expense and getting no satisfaction.

This adverse condition did not exist in the days of the flat flame burner, but now, that the use of mantles has become universal, the selection and care of gas lighting appliances is a problem quite beyond the skill of the average consumer.

Experience has shown that where arc lights, or even single-mantle lights are left to the care of the consumer, they are allowed to deteriorate in appearance and efficiency, very much to the discredit of the gas business. If we are to hold the lighting business that we now have, it is imperative that we exercise some control over the selection and care of burners.

Demand for More Light

There can be no question but that stores are generally very much better lighted than they were before the advent of the gas arc.

As soon as this appliance was presented, the more progressive merchants adopted it, and their brightly lighted stores did the rest.

This condition still obtains, and, while we are educating the public up to the maximum requirement for inside lightings, we have the large field of outside lighting to engage our attention.

This field has hardly been touched but, the lamps that have been installed are creating a "Demand for More Light" that promises a very profitable addition to our business.

Standard of Store Light

The general use of the gas arc will gradually establish this appliance as the "Standard of Store Lighting." These lamps are of fine appearance, highly efficient, and, under a system of maintenance, the customer is relieved of all care of the equipment, and gets more light per 1,000 ft. than by any other plan.

It is expected that in time storekeepers will apply for lamps as a matter of course, just as they now apply for a meter.

This is highly desirable, and will not only save expense in soliciting re-installations, etc., but will add to the security of the business.

Comparison Made the Choice—Gas

The American Pile Fabric Company, plush manufacturers, Adams Avenue and Wingohocking Street, Philadelphia, Pa., spent a full month inspecting various mills to determine upon the best lighting system. After having compared 12 gas-lighted mills with six electric-lighted ones, they gave the order to The United Gas Improvement Company, because they were convinced that gas as an illuminant is always ready, is never out of service, is nearest to daylight in quality, and is best for matching colors—also that it is steady, causes no eye-strain and does not constitute a fire hazard.

This installation consists of 60 Reflex lights, equipped with No. 6 by-passes, No. 533 shades, mica cylinders, anti-vibrators and factory screens. In the office and engine room we placed No. 2076 Reflex lights, equipped with No. 228 opal shades and clear cylinders.

So well pleased were the officers of the American Pile Fabric Company with the gas lights that they did not take advantage of the time allowed for trying out the installation, but paid for it in full in 30 days.—

J. S. Nuttall, New Business.

Publications

1916 Proceedings of the Michigan Gas Association

One hundred and seventy-seven pages; illustrated; 8½ x 6 in.; heavy paper backed. Published by Michigan Gas Association, Clark R. Graves, secretary-treasurer, Lansing.

Includes papers read at last annual meeting and discussions thereon, also address on preparedness by Henry L. West of New York City. Lists past-presidents of association, graduates of the gas fellowship course, the subscribers to the course and present officers. Gives names, connections and addresses of old and new members. Among the papers published are:

President's Address. By Burton L. Laraway.

Heat Treatment of Brass in Neutral and Reducing Atmospheres. By Alfred H. White and Bert A. Standerline.

The Weathering of Gas Coals—A Five-Year Test. By Alfred H. White.

The Present and Future Manufacturing of Water Heaters. By F. A. Lemke.

Present and Future Manufacture of Hotel Ranges. By L. B. Young.

Present and Future Manufacturing of Gas Lighting. By W. M. Blinks.

The Present and Future Manufacturing of Domestic Gas Ranges. By Harry Schall.

Labor Saving Benches for Medium Sized Gas Works. By H. W. Douglas.

New Carbonizing Plant Under Construction at Battle Creek, Mich. By F. G. Remington.

The Importance of Sizing Equipment as Applied to the Sale of Coke in Small Towns. By E. C. Campbell.

Gas vs. Electricity for Heating Japanning Ovens. By Homer T. Hood.

The Influence of Gases Within the Oven on Baking Japans. By Alfred H. White and John T. Naylon.

Pipe Hanger Holds Several Pipes

Patent No. 1,209,286; described in Patent Office *Gazette*, 12-19-16, page 954. Herbert E. Goodwin, Lachine, Quebec, Canada. Filed Jan. 31, 1916. Serial No. 75,398. (Cl. 248-34.)

This pipe hanger, arranged to carry several pipes, is composed of a base and posts secured to the base. Revolvable sleeves operate in the posts and a cap bar, fastened to the posts, prevents the sleeves from sliding off of the posts.

Process for Making Phenols Makes Use of Nickel Catalyzer

Patent No. 1,208,833; described in Patent Office *Gazette*, 12-19-16, page 803. Alexander S. Ramage, Detroit, Mich., assignor to Bostaph Engineering Company, Detroit. Filed April 20, 1916. Serial No. 92,469. (Cl. 23-24.)

High boiling tar acids are sprayed by means of a jet of hydrogen into a chamber maintained at a temperature of 600 deg. C. and containing a nickle catalyst. The resulting phenols are condensed and collected.

News of the Gas Industry

DR. JOHN F. WING.

New President of New England Association of Gas Engineers First Engaged in Gas Business in 1887

Has Been Continuously in the Employ of One Company; First as Chemist and Later as Superintendent of Various Stations

Dr. John F. Wing, who was elected president of the New England Association of Gas Engineers at the annual meeting of that organization held last week in Boston, entered the gas business in 1887 as chemist in the employ of the Boston Gas Light Company.

He was graduated from Amherst College in 1882 and spent two years studying chemistry in Gottingen, Germany. This was followed by three years' work in chemistry and teaching.

He has continued in the employ of the Boston Company up to the present time as superintendent of the various manufacturing stations and has been active in the affairs of the association he now heads.

Police Seize Coal for Gas and Water Plant at Cleveland, Ohio

Armed force, represented by squads of police, moved against the Pennsylvania Railroad at Cleveland, to relieve householders of suffering through shortage of gas and to prevent the closing of waterworks, pumping stations and the municipal light plant through insufficient coal supply.

These drastic measures, while insuring the city enough coal to provide water and light, may mean that employees of the forty-eight plants will enjoy well-heated homes at the price of idleness. The measures were taken because of low gas pressure again accompanying zero weather, and declarations that railroads had so far lost control of the car situation that a coal famine was imminent.

A group of the commissions then called upon Squire, Sanders & Dempsey, counsel for the Pennsylvania Railroad, to acquiesce in seizing the engine, but met with a refusal.

They then proceeded, accompanied by several patrolmen, to the railroad's Whiskey Island yards and, seizing an engine by force, ordered General Yardmaster Heller to provide an engineer. Rather than defy the police this was done and eight cars of coal, belonging to the River Furnace Company, A. A. Teachout & Company and the River Terminal Company, were moved to the pumping stations and the light plant.

Seven other cars are still under police guard, the remaining twenty-one of the thirty-six cars seized Friday having been released because they were consigned to the Illuminating Company and the Cleveland Railway Company.

Bond Issue for Improvements

The Dauphin County Gas Company (Penn.) has given notice of an issue of $23,000 of bonds to reimburse the Harrisburg Gas Company for additions made to the company property last year; the Harrisburg Gas Company of $11,000 for improvements, and the Lykens Valley Light & Power Company of $48,000 for various acquisitions and improvements. The Carlisle Water & Gas Company has filed notice of increase of $34,500 of debt for improvements.

New England Association of Gas Engineers Membership List Includes More Names Than Ever Before in Association's History

Successful Annual Meeting Held in Boston—About 200 in Attendance—Dr. John F. Wing Elected President for Ensuing Year

The forty-seventh annual meeting of the New England Association of Gas Engineers, held at the Copley-Plaza Hotel, Boston, Mass., Feb. 14 and 15, was characterized by an especially large attendance and the extent of discussion aroused by the various papers. The roll of the association, as given in the secretary's report, shows the membership to be larger than ever before in its history.

The meeting was called to order by President H. C. Crafts promptly at 10 o'clock. President Crafts' speech was a hearty welcome to the membership and a review of the gas business for the past year. He enumerated the difficulties under which the New England gas companies had operated during the past year, referring especially to railroad transportation, coal shortage and labor problems, and urged the gas engineers to exercise their keenest intelligence to meet these serious conditions.

In his analysis of the labor problem he laid before the meeting a new method of payment, which includes a sharing of profits, for which method he asked their earnest consideration. He also referred to the tendency of legislation towards lowering the candlepower standard. He strongly commended nineteen companies in Massachusetts who have been operating under an experiment plan of the Massachusetts State Commission requiring 500 B.t.u. gas, the result being reported to the board daily, which data, when fully completed, will provide valuable information for gas interests throughout the country.

He also emphasized strongly the importance of commercial activities among the companies. He recommended the use of modern appliances and stated that the work of the future lay in more extensive cultivation of consumers at present mains. He also referred to the importance of gas lighting and urged the gas engineers to be unusually active to the end that this great volume of business might be retained for the future.

The report of N. W. Gifford, secretary and treasurer, showed 275 active and associated members on the roll of the association, which is the largest number in the history of the organization. He reported the finances as in excellent condition.

F. E. Drake, assistant engineer of the Lynn Gas & Electric Company, of Lynn, Mass., read a paper on "A Few Gas Coals We Have Used." L. J. Williams, Chemist for C. H. Tenney & Company, told of results obtained at Springfield, Mass. Others discussing this paper in-

cluded W. R. Addicks, of the Consolidated Gas Company of New York; Dr. John F. Wing, Everett, Mass.; C. E. Paige, of Malden, Mass., and Mr. Wilson, of the Westmoreland Coal Company. C. J. Ramsburg, of H. Koppers Company, Pittsburgh, stated that tests made in an ordinary laboratory, he felt, were of very little value in view of the increased values developed recently by the demand for by-products.

The following officers were elected for the ensuing year: President, Dr. J. F. Wing, Everett, Mass.; 1st vice-president, J. A. Norcross, New Haven, Conn.; 2nd vice-president, A. M. Barnes, Cambridge, Mass.; secretary and treasurer, Nathaniel W. Gifford, East Boston, Mass.; directors, W. F. Norton, V. E. Bird, Burton Smart, R. E. Slade and C. E. Paige. The attendance was about 200.

In the afternoon session a paper by J. C. D. Clark of Boston was read on the subject "Gas for Lighting," and the keynote of every member who discussed this paper was summed up in the one word, "service," backed up by intelligent salesmanship.

Other papers presented were "Auxiliary House Heating," by A. G. Spinney; "Some New Forms of Oxide," by A. H. Scott, and "Inclined Slots at Newport, R. I.," by J. K. Quinn.

The banquet at the Copley-Plaza Hotel was held on the evening of the fourteenth and was well attended.

Report of Laclede Gas Company Shows Saving to Consumers of Approximately $300,000 a Year

The Laclede Gas Company of St. Louis saved its consumers $125,578.78 in the four and one-half months at the close of 1916, as a result of the reduction of gas rates from 80 and 60 cents per 1,000 cu. ft. to 75, 55 and 45 cents per 1,000. This is a saving of approximately $300,000 a year.

This statement is furnished to stockholders of the Laclede in its annual report which was recently submitted.

The report shows a decrease in gross revenue for 1916, compared with the previous year, of $68,307.12. The sale of by-products showed an increase of $57,271.66 for the year, which reduced the falling off of gross revenues from $125,000 to $68,000.

Charles L. Holman, president of the Laclede Company, said that the gas-rate cut by the company, effective July 15, 1916, had reduced the average rate paid by consumers per 1,000 cu. ft. from more than 77 cents in July to less than 70 cents in January.

The rate cut was made in consideration of a change from the standard of quality test from candle power to heat units. The gas company agreed to supply 600 British thermal units gas, of about 16 candlepower quality, if the city substituted the heat test for the lighting test, which required 18 candlepower. The State Public Service Commission requires only 570 B.t.u. gas, but 600 was finally settled upon.

The annual report issued by the board of directors shows gross earnings of $4,509,424, and a net income of $2,846,246, after deducting $1,663,177 for operating expenses. The operating expenses were less by $323,672 in 1916 than in 1915, due to advantageous contracts entered into several years ago for the purchase of raw materials and sale of residuals, and also to the favorable market developed for certain by-products due to the European war, according to the report. The result is a net increase in earnings of $255,365.

The loss of $300,000 a year in revenue from gas will be offset in time, the report states, by an increase in the consumption of gas due to the opening of new fields by the low rates offered. Last year the company's net increase in gas consumers was 6,102, and it laid eleven miles of additional gas mains.

In December, the company distributed a bonus of 10 per cent. on the annual pay to each employee, and gave a 10 per cent. dividend to common stock out of accumulated surplus earnings of six years. The total amount thus distributed was about $1,170,000.

Cost of Washington Plant Agreed Upon

A compromise agreement has been reached between the Public Utilities Commission and the Washington Gas Light Company of Washington, D. C., on the cost of reproduction of the company's physical property. The figure agreed to was $9,905,984, which covers all items but land, interest and taxes on land and working capital, including materials and supplies. This development came at a formal hearing before the commission recently and is thought to indicate that the valuation proceedings in the case of this corporation are nearing an end.

When Charles L. Pillsbury, engineer of the commission, submitted this figure as a suggested compromise on the value of the company's property, the company's counsel, Benjamin F. Minor, in turn recommended its adoption. The commission, it is understood, will approve the finding.

Mr. Pillsbury's original estimate of total reproduction costs was $10,830,835.60. In order to establish a basis for compromise, he excluded from this figure, items covering land, interest and taxes on land and working capital. This left his balance at $9,704,590,44. The excluded items will be considered later by the commission. The company's total, exclusive of the items referred to, was $10,046,546.

The two sets of figures, one representing the commission's valuations, and the other the company's, are considered by officials and experts of both parties as remarkably close and uniform as to the various classes of values entering the totals.

Big Well Struck Near Bastrop, La.

Intense excitement prevails in Bastrop, La., on account of a 3,000,000-foot gas well having been brought in by the Morehouse Oil & Gas Company, seven miles out from Bastrop. Extensive boring will be made in this territory within the next few days, and the operators are confident of other big strikes. Drilling will soon begin at Oak Ridge, which is nearer Natchez, Miss.

Representatives of the big oil companies are arriving in large numbers with a view of securing lease acreages from drilling.

A 6,000,000-foot well in the same territory where the strike was made was brought in a few weeks ago. The gas production assures a carbon plant for Bastrop.

National Utilities Will Take Over Several Properties

National Utilities Company, which has been incorporated under the laws of Delaware, with an authorized capital of $10,000,000 preferred and $10,000,000 common stock, will take over the National Properties Company, the National Gas, Electric Light & Power Company and the Jersey Central Traction Company. At present $4,000,000 common and $3,000,000 preferred stock will be issued and $2,500,000 3-year 6 per cent. notes will be sold.

National Properties Company controls the American Railway Company, the Wilmington & Philadelphia Traction Company, the Tonopah Water Company, the Chester County Light & Power Company, the New Castle Electric Company of Delaware and the electric transmission lines formerly owned by E. I. du Pont de Nemours Powder Company. National Gas, Electric Light & Power Company controls ten gas and electric companies in New York, Ohio, Indiana, Michigan, New Jersey, Pennsylvania and Illinois. Jersey Central Traction operates 41 miles of electric railway connecting Perth Amboy, Keansburg, Red Bank and other New Jersey towns. In all, the companies under the new holding company will furnish electric light and power to fifty communities, gas to eleven cities and operate about 623 miles of electric railway.

Owners of preferred stock of National Properties Company are offered 90 per cent. of the par value of their holdings in new 6 per cent. collateral trust bonds of that corporation and 10 per cent. in preferred stock of the new company. Holders of National Properties common are to receive $47.64 in cash, 30 per cent. in 6 per cent. notes of the new holding company and $20 in its new common stock for each share. It has not yet been announced on what terms the National Gas, Electric & Power and the Jersey Central Traction securities will be exchanged. Van Horn Ely, now president of the National Properties, will be president of the new corporation, and combined earnings of all properties under the new holding company in 1916 were $9,327,702.

N. C. G. A. Manufacturers' Meeting an Interesting One

Manufacturers' section of the National Commercial Gas Association held a meeting at Hotel McAlpin, New York City, Feb. 8, 1917, 8 p.m., with H. D. Schall, president, presiding. The following members were elected to the section:

R. Williamson & Co., Chicago, Ill.
Lovekin Company, Philadelphia, Pa.
Nichols Gas Fixture Company, Brooklyn, N. Y.
Gehnrich Indirect Heat Oven Company, Brooklyn, N. Y.
Strong, Carlisle & Hammond Company, Cleveland, Ohio.
Remington Typewriter Company, New York, N. Y.
Pittsburgh Coal Company, Pittsburgh, Pa.
The Meyercord Company, Chicago, Ill.
The Central Foundry Company, New York, N. Y.
The Scientific Heater Company, Cleveland, Ohio.
Detroit Brass Works, Detroit, Mich.
Barnes & Ramirez, New York, N. Y.

The Exhibition Committee reported that satisfactory arrangements had been perfected with the Hotel Statler, Detroit, for the exhibition of appliances at the annual convention of the National Commercial Gas Association at that city, Nov. 12-17. The spaces permitting eighty exhibitors have been prepared, all of which spaces are located, as in former conventions, on the meeting room floor. The action of the Board of Directors of the N. C. G. A. was approved by the section, whereby exhibitors must hold membership in the Manufacturers' section as well as company membership in the Association to exhibit. Recommendation was made to permit the gas journals to become members of the Manufacturers' section, and on motion the recommendation was adopted, and all gas journals have since been invited to become members in the section.

Reports were received from the Advisory Committee to the Board of Control, Publicity Committee and Membership Committee through the various chairmen.

The treasurer reported the section in a very satisfactory financial condition after all expenses of the Atlantic City Convention had been paid.

The attendance at this meeting was rather interesting, representatives from the following companies being present:

Detroit Stove Works.
Welsbach Company.
Sprague Meter Company.
Eclipse Gas Stove Company.
Nichols Gas Fixture Company.
Bayley & Sons, Inc.
Union Stove Works.
J. J. Griffin & Co.
Geo. M. Clark & Co.
Davis-Bourneville Company.
Improved Appliance Company.
William M. Crane & Co.
James B. Clow & Sons.
A-B Stove Company.
B. Ryan & Co.
Rathbone, Sard & Co.
N. Tufts Meter Company.
Lattimer-Stevens Company.
Barnes & Ramirez.
Superior Meter Company.
Baltimore Gas App. Company.
Roberts Brass Company.
Maryland Meter Works.
Humphrey Company.
American Meter Company.
Pittsburgh Water Heater Company.
Sentinel Manufacturing Company.
Erie Stove & Manufacturing Company.
General Gas Appliance Company.
Roberts & Mander Stove Company.

After the usual routine of business, E. S. Dickey addressed the meeting in a very able paper which was well presented and freely discussed. This paper will be published as soon as the discussion can be edited by the paper committee and one concrete paper offered.

The keynote of Mr. Dickey's paper was to stimulate interest in and in every legitimate manner possible to encourage a better understanding and to promote a better feeling between the gas man and the appliance man, so that they may have a closer spirit of co-operation and a clearer view of the necessary business relations which must prevail to the end that we may all reap the full benefit of development in a business which after long years of existence is just beginning to find itself in the technical and scientific broadening of its scope of operation.

Mr. Dickey dwelt on the objects in the formation of a Manufacturers' section and pointed out the great benefits that can be derived by closer co-operation of manufacturers and the educating of our own salesmen to a higher point of efficiency.

Mr. Dickey's offering was discussed by the following gentlemen:

Joseph B. Reidd, Irvin W. Peffly, W. Griffin Gribbel, S. Tully Wilson, William M. Crane, F. M. Hamerstrom, Geo. D. Roper, Harry D. Hunter, Russell E. Sard, Earl W. Roberts, John W. Daly and others.

At the next meeting of the section it has been suggested that a paper on the subject of "Improvement of Present Merchandising Methods and Analysis of Present Market Conditions" be prepared.

WILL W. BARNES,
Secretary.

Commission Matters in Massachusetts

A hearing was held Feb. 18, by the public lighting committee of the Massachusetts Legislature on a report of the High Cost of Living Commission, so far as it related to the cost of fuel, either gas, electric, coal or wood. The Commission recommends that the public be instructed in the economical use of gas, etc., and that the Gas and Electric Light Commission prepare a pamphlet containing advice on the subject of fuel uses in cooking, such as is done by the Consolidated Gas Company in New York. This company was spoken of by the commission chairman, Hon. Robert Luce, as having sent representatives into 80,000 homes the past year, with practical demonstrations and lessons in cooking.

Another proposal of the commission is that the coke be sold in small quantities at the same price per ton as in ton lots. This suggestion has been acceded to by most of the coal and gas companies. Respecting the proposal to place the sale of coke and coal under the direct regulation of the gas and electric light commission, Chairman Weed, of the commission pointed out by letter that this would entail extra work that would require added appropriation.

A. E. Pillsbury, Esq., counsel for the gas interests, pointed out that any restraint on gas companies in the sale of their residuals would necessarily be reflected in the selling price of gas. He questioned the constitutionality of any price restriction and said the gas board now has more than it can do promptly. Gas companies are willing to sell small bags of coke at ton prices, undelivered, but it is impracticable to require them to keep any specific supply on hand, as the commission suggested.

Another measure before the lighting committee sought to make it easier for a municipality to acquire a lighting plant. It was proposed to substitute a single majority vote by the city government for two votes in successive years, of two-thirds majority. The advocate of the measure claimed that the two vote requirement gave opportunity to the corporate interests, to head off the second favorable vote and made it unduly hard to enter on a municipal project.

A second measure proposed to make it possible for a municipal plant to be constructed without the purchase of an existing plant. Counsel for the gas and electric companies, Messrs. Pillsbury & Burdett pointed out that the law which originally gave cities and towns authority to enter the lighting field, placed the proviso in the statute that owners of private plants be compensated fairly for property taken. To set this provision aside would be alike unfair to investors and dangerous for the municipality.

Competing plants are forbidden by the present law, it being required that the existing company shall sell, and the city buy, the plant already in the field, at a price fixed by arbitrators selected in the usual manner. A similar measure to the above has been introduced each year for five years.

New Holder Completely Paid For

The city of Escanaba, Mich., has made the last payment on the new gas holder which was completed and put into operation an Jan. 2. The new holder has been accepted by the city and has been found to be in perfect working condition. It was built by Stacey Brothers Construction Company of Cincinnati, Ohio.

Artificial Gas to Supplement Natural Is Best Method of Conservation Declares Doherty

Lavish waste of low-priced gas is the chief reason for the present low supply of gas and bankrupt distributors, according to Henry L. Doherty, head of large eastern interests controlling stock formerly owned by the Kansas Natural Gas Company, and star witness for the plaintiff in the suit for injunction to prevent lower gas rates now pending in the Federal Court of Kansas.

"The antagonism shown us by the state utilities commission has led to the abandonment of our plans to add extensions of lines in an effort to better the gas supply," Mr. Doherty said when on the witness stand. "Without reasonable assurance that the commissioners will stand behind us in our effort to help the situation, we can do nothing."

The financier said any effort to gauge a rate by the degree of service given consumers is futile, when the commodity dealt with is an exhaustible one, supplied by nature. Two years of high rates such as 45 cents a thousand feet, he declared, would so accustom consumers to conserving the supply that a reduction to a reasonable rate, 30 or 32 cents, would find the amount used scarcely 66 per cent. of that required before the high rate was made effective.

Three solutions for the problem were pointed out by Mr. Doherty. Either the natural resources will have to be supplemented with artificial gas, the company will be forced to refuse taking on additional customers, or a part of the cities now receiving gas will be cut off. The second plan, according to the magnate, holds little promise of relief, since the supply is already inadequate. The cutting off of several cities, so that they will receive only a part of the supply now used, to be supplemented by artificial gas, is the best solution, he declared. In the event of the adoption of such a plan, recompense to those cities sacrificed would be made by the company, Doherty intimated.

N. C. G. A. Desires Suggestions as to National Gas Range Week

It is not too early to begin now plans for special selling campaigns which will make 1917 the biggest year in history of gas companies.

National Gas Range Week is an established occasion in both the minds of gas men and public. Early May is already visible on the calendar and plans, if they are to reap the biggest possible results, must be well matured. A spirited and successful Gas Range Week will help prepare the way for National Gas Heating Week in October and National Gas Lighting Week in November.

In the first place we take it for granted that you will tie up your energies with the National Gas Range Week, as determined by the N. C. G. A. The advantages and opportunities for increased business which this national campaign offers are too big to be missed.

1. The season is right for selling ranges.

2. The public has already got the idea from two previous very successful national campaigns.

3. Advertising done by any local company becomes a part of the nation-wide publicity given to ranges at this time, and therefore it gains in force.

4. Each company that works hand in hand with a national enterprise gains in dignity thereby.

5. Each purchaser of a gas range in your district, or any other, becomes a stimulator of the rivalry which exists between women. A little extra argument then, by advertisements and special campaign features, will make a new sale.

6. Each company that enters the campaign gets the benefit of National Commercial Gas Association advertising.

7. Each company may take advantage of plans and selling ideas offered by the N. C. G. A.

8. Figures for 1915 and 1916 show that each company which has entered National Gas Range Week has sold an increased number of ranges because of the campaign.

The first move, then, is the formulation of plans. Send us your suggestion as to the best date for this year. In 1916, May 8-13 was appointed.

How soon after Range Week should National Gas Water Heater Week follow?

What plans and suggestions for the Association's share of the activity and for the individual company's have you to suggest?—*Bulletin of the National Commercial Gas Association.*

Increase in Cost of Oil in Last Year Equivalent to Increase of 5 Cents per Thousand Cubic Feet in Cost of Production of Chicago Company's Gas

Possibility of Using Anthracite Coal in Generators Due to Scarcity of Coke —59 Miles of New Mains Laid During Year—Increase in Number of Meters Set 31,686

The gross receipts of the Peoples' Gas Light & Coke Company of Chicago for the year 1916 were $17,084,878.36, according to the annual report of President E. G. Cowdery. For 1915 these were $17,037,894.02.

During the year 59 miles of mains were laid in extension of the company's system, the total amount of mileage now being upwards of 3,035 miles. The increase in the number of meters set was 31,686, and in the number of gas stoves installed was 28,865, and the loss in the number of arc lamps was 688.

The company has 6,293 stockholders, of whom 3,535 are residents of the state of Illinois.

The year 1916 has been a year of extreme costs for material for gas making purposes. The high prices which affected the general commodities of the country were particularly applicable to oil and other gas producing products.

The annual reports to the stockholders for the year 1915 and for previous years emphasized the desirability of changing the process used by the company in manufacturing gas. The price of gas-oil (which is the principal ingredient in water-gas now manufactured by the company) has continuously and rapidly increased. There seems to be nothing upon which the company can base the expectation that in the future the price will decrease, or even remain stationary.

The continued increase is perhaps, to some extent, occasioned by conditions growing out of the war; but principally it is due to the ever increasing demand for gasoline and other petroleum products which has sprung from the expansion of the automobile industry.

This increase in demand has led to the development of new methods of extracting gasoline, methods which enable the refiners to utilize a much greater proportion of the petroleum or high priced oils, and which, therefore, have led to a great decrease in the supply of the residual gas-oil.

No Reduction in Cost of Oil After War

While it is expected that the termination of the war will result in a general decrease in commodity prices, those who are best posted on the conditions surrounding the oil industry feel that the price of gas-oil will not be decreased when the war ends, but that it will continue to increase. Indeed, there is a growing opinion that the extended use of gasoline and the development of more efficient methods of distillation of petroleum will in a comparatively short time create such a scarcity in the gas-oil residuum as to make it unobtainable except at prices which would prohibit its use for gas-making purposes.

At the time of the last annual meeting the price of gas-oil was approximately

BALANCE SHEET, DEC. 31, 1916

ASSETS		LIABILITIES AND CAPITAL	
Real Estate, Franchise, Tunnels, Street Mains, Services, Meters, Fixtures, Furniture, etc.....	$98,111,499.47	Capital Stock: Authorized, $50,000,000.00. Issued...	$38,500,000.00
Green Street and Other Property	159,526.76	Underlying Prior Lien Bonds	24,427,000.00
Special Deposits and Securities in Hands of Trustees	1,319,620.80	Refunding Mortgage Bonds of 1897.....	20,554,000.00
Oil, Coke, Materials, etc., on hand	1,577,221.67	General and Refunding Bonds of 1913.....	1,712,000.00
Gas Accounts Receivable..	1,155,701.89	Deposits, Security for Gas Bills, etc.	333,239.40
Accounts Receivable.....	956,457.22	Accounts Payable	1,793,233.38
Deposits with Agencies for Bond Coupons	341,120.00	Bond Interest due and accrued	823,678.33
Deferred Expenses	489,331.38	Depreciation and Other Reserves	6,590,533.53
Cash	4,412,310.62	Surplus	13,789,105.17
	$108,522,789.81		$108,522,789.81

4⅓c. per gallon. That was regarded as an extremely high price. The price, however, has continued to advance even beyond those figures, until now the company is compelled to pay approximately 5⅓c. per gallon.

$800,000 (more than 2 per cent. on the outstanding capital stock of the company) it will be readily appreciated how dependent the earnings are upon the price of oil, and how vital it has become to the interest of the consumers and the

The gross receipts of the company from all sources were.....	$17,084,878.36
While the operating expenses, exclusive of bond interest were.....	11,338,868.57
Leaving	$5,746,009.79
Deducting depreciation, reserves, etc.....	1,281,689.12
	$4,464,320.67
Deducting bond interest	2,387,062.51
Leaving net earnings for the year.....	$2,077,258.16

When it is borne in mind that an increase of 1 cent per gallon in the price of gas-oil means an increase of nearly 5 cents per 1,000 cu. ft. of gas made, or an annual expense of approximately

company that there should be a change in the process of manufacture that will permit the company to make itself independent of the cost of gas-oil.

In 1915 the company paid a total of $2,080,284.43 for gas-oil; in 1916 it paid $3,295,751.35; or an increase of $1,215,466.92.

The company is prepared to immediately begin the installation of a coal-gas plant, and will do so the moment the authorities have given their consent to the change from a candlepower standard to a heat unit standard.

INCREASED COST OF COKE

In addition to the increased cost of gas-oil the company has been met with the greatly increased cost in the price of generator fuel. Not only has the price of coke become almost prohibitive, but its scarcity has compelled the company to prepare for the use of anthracite coal in its generators in place of coke.

Anthracite coal likewise is extremely high in price and difficult to obtain in necessary quantities. Furthermore there has been an unprecedented rise in the price of boiler fuel.

Although recognizing the necessity of keeping operating expenses to the lowest possible minimum the officers of the company have also, during the year, been brought to a realization of the difficulties which the present economic conditions have forced upon the employees. Accordingly, on Nov. 1, 1916, an increase of 10 per cent. was given to all employees of the company whose compensation was less than $200 per month. This wage increase has added approximately $356,000 to the annual operating expenses of the company.

VALUATION ALMOST COMPLETED

The engineers employed to make a valuation of the property of the company have been continuously engaged in that work, and it is expected that within a few months their work will be finished, thus giving to the company a detailed inventory of all its physical properties together with a complete valuation as fixed by engineers of national reputation. The expense of this work will be spread over several years, and (with the exception of the portion charged in the operation for 1916) will be found in the balance sheet under the title "Deferred Expense."

Accompanying this article is a condensed trial balance as of Dec. 31, 1916, certified to by the auditor, which shows the result of the operations of the company for the year 1916. There is also shown the gross and net receipts for the twelve months, together with the total mileage of mains now owned and operated by the company, and the number of gas meters, gas stoves, arc lamps and public lamps.

This is equivalent to 5.39 per cent. on the outstanding capital stock of the company, $38,500,000.

It is to be noted that the net earnings for the year were not equal to the dividends paid upon the outstanding capital stock. This has necessitated a withdrawal from the contingent reserve account, as shown in the annexed income report.

DEPRECIATION AND OTHER RESERVES

Dec. 31, 1915.	Balance Depreciation and Other Reserves..			$6,006,951.44
	Divided as follows:			
	Depreciation and Other Reserves.....			$5,166,430.91
	Contingent Reserves		$840,520.53	
Year 1916.	Amount placed in Depreciation and Other Reserves for Year 1916.....			1,087,784.50
	Amount placed in Contingent Reserve for Year 1916		193,904.62	
			$1,034,425.15	$6,254,215.41
	Withdrawal from Depreciation and Other Reserves in 1916.....			273,218.19
	Withdrawal from Contingent Reserves in 1916, as above		424,888.84	
Dec. 31, 1916.	Balance		$609,536.31	$5,980,997.22
	Total Balance in Reserves.....		$6,590,533.53	

SURPLUS

Balance Surplus December 31, 1915.....	$13,800,294.92
Deduct Sundry Charges	11,189.75
At Credit of Surplus December 31, 1916.....	$13,789,105.17

MILEAGE OF MAINS AND NUMBER OF METERS, GAS STOVES, PUBLIC LAMPS AND ARC LAMPS IN SERVICE DEC. 31, 1916

Street Mains.....	3,035	Miles 1,112 Ft.	Gain	59	Miles 2,076 Ft.
Meters	686,905		Gain	31,686	
Gas Stoves.....	458,112		Gain	28,865	
Public Lamps.....	7,862		Loss	2,365	
Arc Lamps.....	99,031		Loss	688	

INCOME ACCOUNT FOR TWELVE MONTHS ENDING DEC. 31, 1916

Gross Receipts from all sources	$17,084,878.36
Operating expense	11,338,868.57
	$5,746,009.79
Depreciation for Street Mains, Services, Meters, Works, Renewals, etc., and other reserves	1,281,689.12
	$4,464,320.67
Bond interest	2,387,062.51
Net Earnings, 5.39 per cent. (on $38,500,000.00 Capital Stock)	$2,077,258.16
Add amount withdrawn from Contingent Reserve	424,888.84
	$2,502,147.00
Dividends paid in 1916 (First quarter at rate of 8 per cent.; Three-quarters at 6 per cent.)	2,502,147.00

Gas and Electric Company Buys Property

The Oklahoma Gas & Electric Company has purchased the light plant at Norman, Okla., from the Norman Mill & Grain Company, Henry Willmering of the gas and electric company said recently.

The Norman plant serves 900 customers. The increase in business which is expected will lead the company to run an overhead transmission line from the plant to Oklahoma City.

W. Porter Jones, who has been general purchasing agent for the company here, will assume management of the business there on Monday. He will also manage the ice plant which is owned by the Byllesby interests.

New Corporations

The Pluto Oil & Gas Company has been organized in Winchester, Ky., with a capital stock of $50,000. The principal stockholders are H. G. Garrett, president; John G. White, vice-president, and J. H. Hardwick, secretary and treasurer.

The Dadenell Oil & Gas Company, Sapulpa, Okla. Incorporators: O. V. Davis, Edgar A. Uden, H. J. Wells, all of Sapulpa. Capital stock, $10,000. Delivered to H. J. Wells, Sapulpa.

Barmore Oil & Gas Company, Tulsa, Okla. Incorporators: S. W. Barnes, Kansas City, Mo.; W. A. Moore, Tulsa; A. R. Moore, Tulsa. Capital stock, $50,000. Delivered to Davidson & Williams, Tulsa.

Jarrett Oil & Gas Company, Oklahoma City. Incorporators: W. R. Jarrett, H. H. Dunlap, A. N. Wilcox, all of Oklahoma City. Capital stock, $5,000. Delivered to W. R. Jarrett, Oklahoma City.

The Hundred Per Cent. Oil & Gas Company, Oklahoma City. Incorporators: J. W. Davis, Drumwright; Charles Medis, Drumwright; Harry White, Oklahoma City. Capital stock, $100,000. Delivered to Harry White, Oklahoma City.

Red Balle Oil & Gas Company, Dacoma, Okla. Incorporators: O. L. Glasgow, S. H. Welch, A. W. Glasgow, A. J. Harter, Dacoma. Capital stock $5,000.

McHighland Oil & Gas Company, Dacoma. Incorporators: John M. Robinson, et al., Waynoka, Carmen and Galena. Capital stock, $15,000.

Chicago Gas Products Company, Chicago. Capital stock to be from $20,000 to $25,000.

Chicago Steel & Wire Company, Chicago, increase in directors.

Added Storage Space for Coal

The Citizens' Gas, Electric & Power Company, Nantucket, Mass., has bought the water front property known as the Crosby coal yard and wharf, to provide for additional storage of coal.

Societies and Associations

THE WISCONSIN GAS ASSOCIATION will hold its 16th annual convention at the Hotel Pfister, Milwaukee, March 13 and 14. The program as arranged is an interesting one. After the regular routine matters, the following papers are to be presented:

"Use of Brine for Thawing Frozen Gas Mains," by W. F. Clausen, Winona, Minn.

"How Can a Manager of a Small Gas Plant Best Develop His Industrial Gas Business," by Bruno Rahn, Milwaukee, Wis.

"Of What Use Can the University of Wisconsin be to the Gas Utilities of the State," by Prof. O. L. Kowalke, University of Wisconsin, Madison, Wis.

Wednesday, a. m., an address will be made by R. S. McBride, associate chemist of the Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., on the work of this department, which lecture will be illustrated by moving pictures. Also a paper entitled "Special Method of Laying Submarine Gas Mains," by A. F. Davey, Green Bay, Wis., will be presented on Wednesday, p. m. The meeting will be under the joint auspices of the Wisconsin Gas and Wisconsin Electrical Association, and a report of the Committee of the Wisconsin Electrical Association on Taxation of Public Utilities in Wisconsin will be given, followed by a paper entitled "Rate of Return," by Halford Erickson, former member and chairman of the Railroad Commission of Wisconsin. Another paper will be "The Commission's Method of Rating Gas and Electric Utilities Service," and will be presented by a representative of the gas and electric service department of the Railroad Commission of Wisconsin. On Wednesday evening at 7 p. m., a joint banquet of the two associations will be held, which will close the session, in the Fern Room of the Hotel Pfister. The Railroad Commission of Wisconsin has announced a hearing to be held in Milwaukee, Friday, the day following the close of the meeting of the Electrical Association on electric safety code, which will no doubt be well attended by representatives of combination gas and electric properties.

Personal Notes

W. C. MULLEN, former manager of the Davenport Gas & Electric Company (Iowa), and for many years a well-known citizen of Davenport, died Feb. 10 at his home, 912½ West Third Street, following a lingering illness. He was 62 years old.

THE AMERICAN PUBLIC UTILITIES COMPANY have made several changes in their Grand Rapids (Mich.) office, as follows: Charles O. Murphy has been appointed assistant general manager of this company; L. B. Andrus has been appointed chief engineer, succeeding B. T. Gifford; George R. Horning will assume the duties of gas engineer, effective March 1, 1917, succeeding S. W. Cheney; R. L. Aage was appointed auditor, effective Jan. 1, 1917; M. B. Wheeler will be appointed commercial agent of this company, effective March 1, 1917.

H. C. DEFFENBAUGH, formerly of the engineering department, of the Rochester Railway & Light Company, resigned recently to accept a position as engineer and assistant to the secretary of the Empire State Gas & Electric Association. After graduating from Cornell in 1906, Mr. Deffenbaugh entered the employ of the Rochester Company as station attendant. After working in the line department, on construction work, and miscellaneous investigations, he was placed in charge of rate work as cost engineer. Mr. Deffenbaugh's experience gained while with this company will no doubt prove valuable in his new work. H. O. Sommer, of the engineering department, has been appointed to take charge of the rate work.

L. W. LAYMAN, superintendent of the service improvement department of the Rochester Railway & Light Company, resigned recently, and since Feb. 1, has been connected with W. H. Rowerdink & Son of 84 North Street, Rochester, N. Y. Mr. Layman was with the company for about twelve years. E. F. Gosnell has been appointed to take over Mr. Layman's work, together with some allied group work in the consumers billing department.

CHARLES B. HEALEY, office manager at the Woonsocket Division of the Blackstone Valley Gas & Electric Company, who recently underwent a rather serious operation, is now rapidly improving.

FRANK B. ENSLOW, one of the founders of the Columbia Gas & Electric Company recently dropped head at Charles-

ton, W. Va. He was regarded as one of the best informed officers of the company in regard to its properties and leases, many of which were under his special charge.

W. E. O'NEIL, who for the past ten years has been superintendent of the Norwich (N. Y.) Gas & Electric Company, has been appointed superintendent of the Ithaca (N. Y.) Gas & Electric Corporation, succeeding J. W. MURDOCK, who has been appointed general superintendent of the Associated Gas & Electric Company's properties in New York State. P. R. CHAMBERS, formerly manager of the Manatee Electric Company of Bradentown, Florida, succeeds Mr. O'Neil as superintendent of the Norwich Gas & Electric Company.

THE PEOPLES GAS, LIGHT & COKE COMPANY of Chicago re-elected the retiring directors at a recent stockholders meeting. The directors in turn re-elected the officers.

R. U. STEELQUIST, local manager of the Oregon Power Company, at Dallas, Ore., has been elected vice-president of the Dallas Commercial Club.

EMPLOYEES OF THE LYNN (MASS.) GAS & ELECTRIC COMPANY held a midwinter outing and dinner at Nahant on the evening of Feb. 8. Informal speeches were made by several officials of the company.

CARL SPRAGUE of Berwick, Pa., has entered the employ of the Old Colony Gas Company and will assume the duties of superintendent in Whitman, Abington and North Abington, Mass.

FRED C. BUTLER, formerly superintendent of the Greenfield Gas Company, has succeeded Colonel G. M. Rossman of Keene, N. H., as manager of the Greenfield Company.

GEORGE P. SMITH, manager of the Old Colony Gas Company, has recently been elected secretary of the New England Gas Association.

HENRY HOFFMAN, of the Athol Gas & Electric Company, Athol, Mass., has entered the employ of the Old Colony Gas Company and will act as District Representative in the town of Braintree, Mass.

THE NEW HAVEN GAS LIGHT COMPANY recently held their annual meeting at which the directors re-elected the following officers: Charles H. Nettleton, president; G. D. Watrous, vice-president; J. Arnold Norcross, secretary-treasurer; Robert E. Wyant, engineer.

Construction Notes

Seven-Mile Pipe To Be Laid Across Bay

Corpus Christi, Tex. will harness the huge natural gas well that has been flowing there for the past three years, according to announcement made recently, by Mayor Roy Miller of that city.

Mr. Miller said that the city is at present working on a franchise which it will grant to a corporation that has just been formed for the purpose. He says that a meeting of the council is expected when he returns to his city to consider the franchise which was being drawn up by attorneys for the city and the company.

The well at present is making about 10,000,000 feet a day. It has made from 50,000,000 to 100,000,000 feet a day since the first flow started in November, 1914. It has been pronounced by experts to be one of the largest natural gas wells in the world.

Mr. Miller says that the company to which the franchise will be granted will pipe the gas across Nueces Bay, a distance of seven miles, to the city of Corpus Christi and sell at retail to the consumers of that city. He said that the franchise will embody a maximum of 45 cents per 1,000 to individual consumers and a maximum of 15 cents per 1,000 to manufacturing and wholesale consumers.

The gas from this well is high in heat units, the average being something above 1,000. When the average for artificial gas, 500 heat units, is taken into consideration, it will be seen just how powerful the natural gas there is.

More Improvements at Indiana Company

During the last few months the Warsaw (Ind.) Gas Company has been making a number of improvements at the works, including the installation of three benches of modern design. Machinery has been ordered for a new high pressure system which will be put in operation in the early spring and connected to an entirely new main for Winona Lake, running along Smith Street and connecting on the present main at Dalton's foundry. This new main will better equalize the pressure over the entire distribution system during the hours of maximum use of gas.

Plans are under way for building a new retort house with new benches and carbonizing machinery complete, and, while the gas works now in use are sufficient for present needs, it will be necessary for the company to make this additional investment in new buildings and equipment to meet the future demands of the prosperous and growing city of Warsaw.

The pipes are now on the ground for an extension on North Lake Street, which extension will be made as soon as the ground thaws sufficiently to permit digging.

To Double Capacity of Wisconsin Plant

A new gas plant for Stevens Point, Wis., has been ordered by the Wisconsin Valley Electric Company, and the present capacity is to be doubled within the next three months, according to an announcement by Local Manager A. H. Sikes. The company will install a new bench of gas making machines that will have a capacity of 60,000 cu. ft. a day or twice the capacity of the old machine which will be retained as a reserve. The older machine, while useful for many years, would be overloaded by summer by the demands of the city at the present rate of increase of consumption.

The new machine will arrive here in probably a couple of months and another month will be required to place it. Foundations will be laid for two of the new machines but only one will be installed at this time. This one machine will double the present output of gas. The cost, with the foundation, will be about $4,000.

The remodeled plant will consume about five tons of coal a day, it is estimated. The company plans to erect coal bunkers or sheds to house about 500 tons of coal, the policy being to keep three or four months' supply of coal on hand to guard against any emergency such as strikes, etc. At present most of the coal is piled outside. The new shed will be built the coming summer.

Another notable improvement planned for the coming summer is the connecting of all the dead ends of mains about the city. There are a good many such ends here and the efficiency of the service is impaired thereby. The contemplated improvement means a good deal of main laying this year.

Contract Closed for New Plant

The trustees at Sausalito, Cal. have closed a contract with George L. Fish for the erection of a gas plant and the construction of a distributing system. Mr. Fish acting on behalf of the Union Gas-Electric Company, of which Frank Jordan, Secretary of State, is treasurer.

The contract provides that Fish and his associates are to build the plant and install the distribution system for cooking, heating and power service. Before any gas is sold the promoters are to turn the entire plant over to the city and it is to be operated as a municipal enterprise. Gas is to be sold to the citizens at $1 a thousand feet for a period of ten years. During this period Fish and his associates are to receive all the profits, thus getting back the amount of money invested and a fair interest.

Second Furnace at Glass Company to Use Artificial Gas

The Imperial Glass Company at Martins Ferry, Ohio, will in the very near future be operating one of its furnaces with artificial gas furnished from the gas producer which is located just west of the plant. Men have been at work for some time making changes in furnace No. 1 in order that it might be heated with gas from the producer. The producer is now at work and fire has been lighted in the furnace. Indications are that the producer will work satisfactorily.

It is said that furnace No. 2 will also be altered so it can be kept going with the artificial gas from the gas producer.